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Yellowstone Basin And Adjacent Coal Area
Level B Study
Montana, Wyoming, North Dakota

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The Missouri River Basin Commission is the principal agency for the coordination of federal, state, interstate, local and nongovernmental plans for the development of water and related land resources in the area served by the Missouri River and its tributaries. As an independent regional commission, it provides a forum in which states meet with federal agencies to conduct and coordinate water and related land resources planning. The commission's chairman is appointed by the President; its vice-chairman is elected from among state members.

MRBC members are Colorado; Iowa; Kansas; Minnesota; Missouri; Montana; Nebraska; North Dakota; South Dakota; Wyoming; Department of Agriculture; Department of the Army; Department of Commerce; Energy Research and Development Administration; Environmental Protection Agency; Federal Power Commission; Department of Health, Education and Welfare; Department of Housing and Urban Development; Department of the Interior; Department of Transportation; Yellowstone River Compact Commission; Big Blue River Compact Administration. Canada is an observer.

PLAN OF STUDY

Yellowstone River Basin and Adjacent Coal Areas

Montana, Wyoming, and North Dakota

May 1976

Missouri River Basin Commission
Yellowstone River Basin Study
Transwestern Life Building-Room 332
404 N. 31st Street
Billings, Montana 59101

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ACKNOWLEDGMENT

This Plan of Study was prepared by the Study Manager and Assistant Study Managers for the states of Montana, Wyoming, and North Dakota. Review and assistance was also rendered by members of the Study Management Group. Added critique and evaluation services were provided by staff members of the Missouri River Basin Commission under the guidance of Nicholas L. Barbarossa, Director of Planning and Technical Services.

Appreciation is extended to all individuals who provided inputs, comments, and review of the Plan of Study.

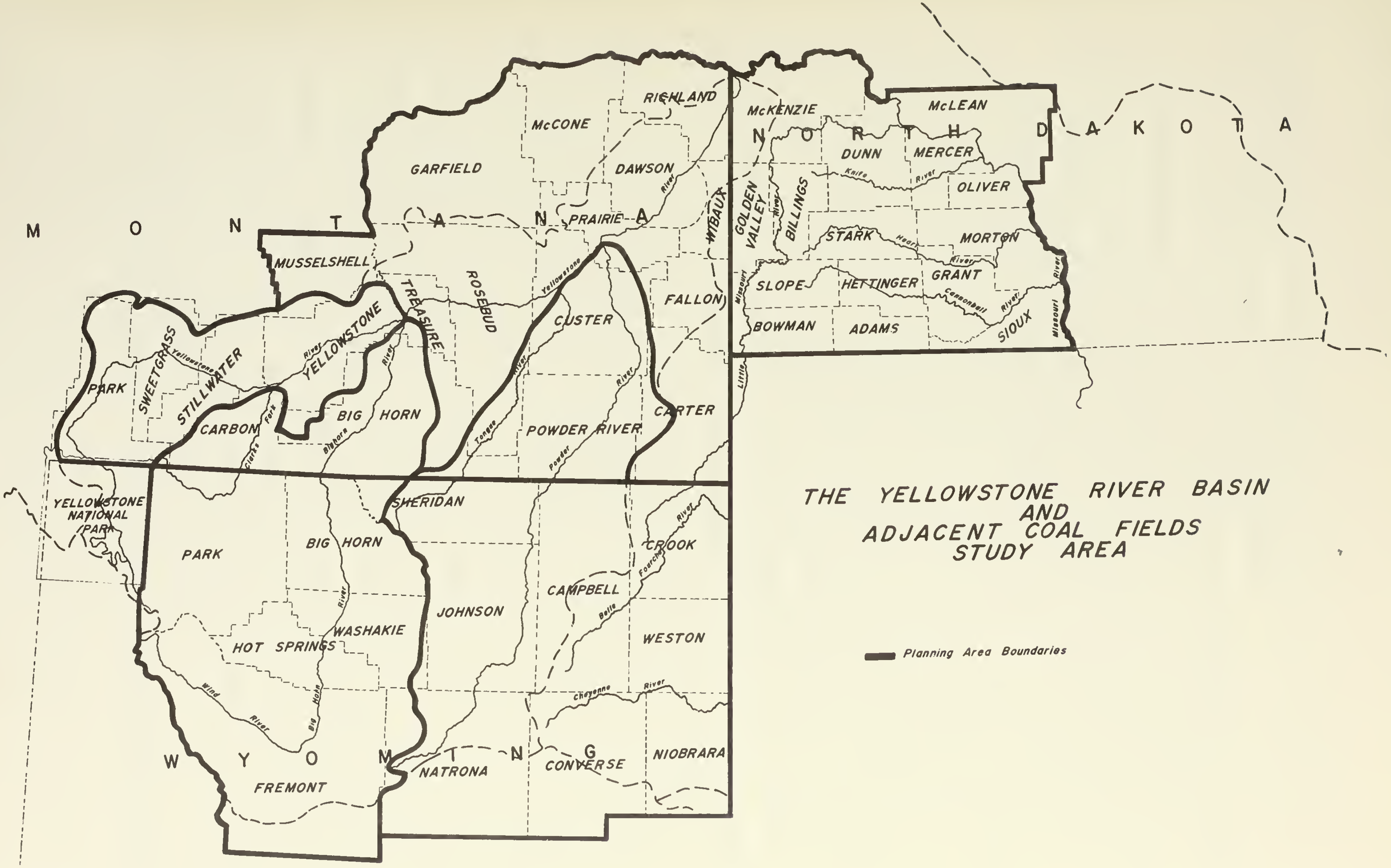
Revisions and modifications in this Plan of Study will be made as the planning program evolves and as the dynamics of the planning process become operational. The Plan of Study is not intended to be an absolute, fixed-in-time procedures manual for performance of the study; rather, it is to serve as a flexible guideline document for the effective management and control of the various tasks and assignments in the study.

SUMMARY

This Plan of Study for the Yellowstone Basin and Adjacent Coal Area is a guideline for use in developing a set of management alternatives for development and conservation of the water and related land resources of the Study Area. The Study Area includes the drainage of the Yellowstone River and adjacent coal resource areas in the states of Montana, Wyoming, and North Dakota, encompassing over 123,000 square miles in all or part of 51 counties. This is referred to hereinafter as the "Study Area" or "Area". Figure 1 is a map of the Area.

The size of the Study Area and the regional diversities therein give rise to a wide array of resource problems, issues, and needs. A major question to be answered is: Will the water supply be adequate in quantity and quality to meet the forecasted demands? Some of the future water and related land uses and needs are: maintenance and expansion of dryland and irrigated agriculture; water supplies for industrial and energy resource developments; water quality, outdoor recreation; fish and wildlife; and land and water resource management and administration. Flood control needs will also be considered. The study will identify the most significant water and related land resource problems and needs as they pertain to local, state, regional, and national objectives, and will identify alternative means and methods to deal with them. Additionally, the study report will identify appropriate agencies to complete more detailed feasibility studies and plans and priorities for implementation recommendations. The study will focus on middle term (10 to 25 years) needs and objectives of the Study Area, where the year 2000 will be considered as the horizon planning time frame.

Coal deposits in the Area have been receiving increasing attention nationally under the two-fold impetus of a scarcity of petroleum supplies and



THE YELLOWSTONE RIVER BASIN
AND
ADJACENT COAL FIELDS
STUDY AREA

the problems of many established coal areas in the eastern United States in supplying coal which can meet air quality standards.

To many residents in the Area the potential coal development is a threat to the environment and their way of life. To others, coal development is looked upon as a welcome economic stimulus to a sparsely settled area lacking many of the amenities that an increased coal related population can bring.

The three states, Montana, North Dakota, and Wyoming, have differing views on the benefits or dangers of coal related growth. However, the three states do agree, as do the federal agencies and the Missouri River Basin Commission, with the need to develop alternative plans therefor and thus evaluate the physical and social changes that could occur with coal and related developments. Armed with alternative plan evaluations they could better determine the need for further study and new legislation, or take positive action to prepare for and assist local governments with their growth problems.

Plan formulation will be accomplished in accordance with the Water Resources Council's Principles and Standards for Planning Water and Related Land Resources that were established October 25, 1973 pursuant to Section 103 of the Water Resources Planning Act (PL 89-80). The Principles and Standards along with guidelines developed for their implementation provide for uniformity and consistency in comparing, measuring, and judging beneficial and adverse effects of alternative plans. Included will be analyses of various alternatives for fulfillment of the two major objectives -- national economic development (NED) and environmental quality (EQ). Also, elements to meet State/Regional (SR) objectives will be included. These analyses will enable evaluations of each plan utilizing four accounts: national economic development, environmental quality, regional development, and social well being.

Multiple objective plans will be formulated to reflect varying degrees of emphasis on the two major objectives, NED and EQ, and for the SR objectives as conditions warrant. The plan formulation process will include: identification of existing and projected problems and needs and specification of components of the multiobjectives that are pertinent to the identified problems and needs; evaluation of resource capabilities; formulation of alternative plans to achieve varying levels of contributions to the specified components of the multiobjectives; analyses of differences among alternative plans to show tradeoffs among the specified components of the multiobjectives; formulation of an optimized NED Plan and an emphasized EQ Plan; the development of a State Regional element analysis; and selection of a Recommended Plan based upon an evaluation of the beneficial and adverse effects and the tradeoffs among the objectives.

The field draft of the report is scheduled for completion by August, 1977, and is estimated to cost $2.405 million of which $1.115 million are federal funds and $1.29 million the value of state inputs.

Because diversity and controversies about objectives are problems in the Area, a high degree and extent of public participation must be attained throughout the planning process. This involvement will include special interest groups and the general public.

Management of the study will be the responsibility of the Study Manager, with assistance from the Assistant Study Managers for the states of Montana, Wyoming and North Dakota. The Study Manager and Assistant Study Managers are MRBC staff members. The Manager will also be assisted by the Study Management Group comprised of representatives of the federal departments or agencies including the Corps of Engineers, Department of the Interior, Environmental Protection Agency, and Department of Agriculture, the states of Montana, North Dakota, and Wyoming, and a representative of the Indian tribes. Performance of task assignments will be accomplished by Study Teams comprised of local, state, Indian, and federal agency personnel, business representatives, interested development, conservation, and environmental groups, and private individuals.

INTRODUCTION

Background and Authority

The Missouri River Basin Comprehensive Framework Study, published by the Missouri Basin Inter-Agency Committee in December 1971 stated that the principal planning objectives for the Yellowstone Basin were "to intensify agricultural production and processing of agricultural products, development of industrial processing of coal, and expansion of the recreation and tourist industry."

Shortly after completion of the Framework Study, the national energy crisis placed increasing emphasis upon resource planning in the Study Area. A number of programs and studies (North Central Power Study, Montana-Wyoming Aqueduct Study, Project Independence, Northern Great Plain Resource Program, Eastern Powder River Wyoming Coal Development Environmental Impact Statement, and the Wyoming Framework Water Plan, etc.) were completed that showed the necessity to accomplish a comprehensive plan for the Yellowstone Study Area at the earliest possible date.

In February 1974 the Missouri River Basin Commission responded to the need for the Yellowstone study and gave a high priority to its initiation. On April 1, 1974, a request was submitted to the Water Resources Council for funds to develop a Proposal to Study (PTS). At the May 1974 Commission meeting a motion was approved by consensus which directed the MRBC Chairman to appoint a special Action Task Force on the Yellowstone Basin and adjacent coal area.

The Action Task Force proposed that a Level B type study be undertaken. A PTS was prepared and submitted to the Water Resources Council in July 1974 with a request by the MRBC Chairman for funds to initiate the study in FY 1975.

Funds for initiation of the study were not made available for a FY 1975 start. Thus the proposal was deferred, but with a priority consideration for

FY 1976 funding. In response, the Yellowstone study was one of two new Level B starts that the President recommended in his FY 1976 budget request. Congressional approval and an appropriation of funds for the study was attained in December 1975 with study program start-up projected for early 1976.

Authority for the study is the Water Resources Planning Act of 1965 (PL 89-80, 42 U.S.C. 1962, as amended). The plan to be prepared is a Level B type, which is regional or river basin in scope and involves a reconnaissance-level evaluation of water and related land resources for the selected area. Level B plans are prepared to resolve complex, long-range problems identified by framework studies and assessments; focus on middle term (15 to 25 years) needs and desires; involve federal, state, and local interests in plan formulation; and identify alternative plans and recommend action plans or programs to be pursued by individual federal, state, and local entities.

Study Area Description

The Study Area encompasses the 51 counties or portions thereof in Montana, Wyoming, and North Dakota which are within the hydrologic boundary of the Yellowstone River plus those counties outside the hydrologic boundary, but within the coal resource area of eastern Montana and Wyoming and western North Dakota. See Figure 1. These counties are:

Montana

Big Horn
Carbon
Carter
Custer
Dawson
Fallon
Garfield
Golden Valley
McCone
Meagher
Musselshell
Park
Powder River
Prairie
Richland
Rosebud
Stillwater
Sweet Grass
Treasure
Wibaux
Yellowstone

Wyoming

Big Horn
Campbell
Converse
Crook
Fremont
Hot Springs
Johnson
Natrona
Niobrara
Park
Sheridan
Sublette
Teton
Washakie
Weston

North Dakota

Adams
Billings
Bowman
Dunn
Golden Valley
Grant
Hettinger
McKenzie
McLean
Mercer
Morton
Oliver
Sioux
Slope
Stark

The Study Area does not include Yellowstone National Park.

For purposes of this study the total area which covers over 123,000 square miles has been subdivided into the seven (7) planning areas delineated on Figure 1, and defined below:

Montana

Mainstem of Yellowstone River above the Bighorn River
Mainstem of Yellowstone River below the Bighorn River and Adjacent Coal Area
Clarks Fork of Yellowstone and Lower Bighorn Rivers
Tongue and Powder Rivers

Wyoming

Wind, Bighorn and Clarks Fork Rivers
Tongue and Powder Rivers and Adjacent Coal Area

North Dakota

Little Missouri, Knife, Heart, Cannonball, and Grand Rivers and Adjacent Coal Area

Problems, Needs, and Objectives

The Study Area is a sparsely populated, semiarid portion of the Missouri River Basin in the states of Montana, North Dakota, and Wyoming. Historically, the economy has been based on the natural resources of the area, in crop and livestock agriculture, mineral production, tourism, hunting, and fishing.

While there have not been major water and related land resource problems to either inhibit water and land development or prevent enjoyment of the area's scenic resources in the past, concerns and obvious conflicts are now evident. Many of these come out of the progressive utilization and increasing competition for stream flows for both instream and out-of-stream uses. Thus, people involved with agriculture are concerned about the adequacy of the water supplies to meet existing and potential irrigation and livestock needs.

While showing limited development earlier, another of the area's natural resources, coal, exists in abundance and the impact of its possible development and processing locally concerns the people, their policital representatives, and state and federal agencies having water, land, and air quality management responsibilities. This adds to other concerns for envisioned, possible heavy, uses of water supplies for industrial processing of the coal, possible condemnation of privately owned surface lands to develop subsurface minerals, potential air pollution impacts on range vegetation and crops, and recreational resources from mine mouth coal and gas production facilities, and most important, the impacts of rapid industrial growth on the socioeconomic structure. Owners of farm and grazing lands particularly are concerned for the uncertainties that mined lands can and will be returned to productivity through proper reclamation.

The environmentalists are concerned about degradation of the fragile terrestrial ecosystem which can occur with over use or misuse of the resources. There are fears that the normal agricultural growth and now the envisioned industrial growth will have substantial adverse impacts on the quantity and quality of stream flows and ground waters, and on the aquatic and terrestrial ecosystems of the area. There is general concern that the now abundant wildlife resources may be diminished or degraded and the present high quality of outdoor recreation impaired. Businessmen who derive their livelihood from tourism, and others in this field of interest, express concerns about air pollution as well as any degradation in quality of the water and scenic resources.

When Indian reservations were designated, the United States Government claimed the Indians' rights to use then-unappropriated water rising on, flowing through, or flowing past the reservation to fulfill the purposes of the reservations; however, at that time--and to date--no quantity or specific use for the water was defined. This is true also for the national park, forest, and other federal lands for which water is claimed but not quantified. This creates, in the Study Area as in many other areas, uncertainty on the availability of future water supplies and thus in developing plans for their utilization and administration. Many people hold that the magnitude of Indian rights should be set by the amount of water required to irrigate the practically irrigable lands within the reservations, while many tribal members feel that they are entitled to the water for any purpose, both on and off the reservation.

Several Indian tribes in the region are concerned how coal development on or near their reservations might impact their water rights, resources, and cultural values. On the one hand, they fear that with coal development they will lose control of their reservation coal resources and the land base that is central to their way of life; yet they value coal development for its potential job opportunities and related income to alleviate unemployment and other economic problems.

A subtle concern generally involves the social structure of the communities and how this may be affected by any major new industrial development--first in the form of coal mining, but more so if, in addition, there is expansive processing of the coal by gasification or liquefaction, or, in generating electrical power locally. Other people are eager for development, visualizing an expanded economic base, new jobs, better services, and broadened cultural horizons.

While recognizing the many natural characteristics of the area that make it a region, it must be recognized that it does comprise parts of three states--each with its own constitution, laws, and policies, and institutions founded on somewhat varying origins, concepts, and traditions. This imposes the need to recognize state objectives as well as hydrologic, natural resource, and geographic boundaries and potentials.

Even if there were no potential coal-related problems such as described, this area would face many other resource development, preservation, and management concerns found in other problem areas:

(1) Many of the small communities have water supplies of inadequate quantity or quality.

(2) Flooding of agricultural lands and urban communities is a recurring, if not a major, problem.

(3) Although fishing and hunting opportunities appear to be adequate to meet measures throughout most of the 1980-2000 period, the population distribution will create shortages near the coal areas and other metropolitan centers.

(4) Outdoor recreation needs and opportunities should be evaluated and fulfilled.

(5) Land use structural controls and management improvement plans need to be developed and implemented.

(6) Municipal and industrial waste treatment plants need upgrading.

The objectives of this study are to define as accurately as possible the range of possible future requirements which could have a measurable impact on the water and related land resources of the area; determine the nature and magnitude of that portion of the requirements that will be met by private initiative; define the remaining needs and problems; develop plans to meet the needs, emphasizing the environment or national efficiency; and formulate a recommended plan for the Study Area, providing a balanced recognition of both environmental and economic development goals.

The recommended plan and other water resource use alternatives will be displayed to provide information for establishing state and MRBC priorities, provide information to resolve critical water use conflicts, identify state and federal legislative needs, and define future study and research needs.

Purpose of the Plan of Study

The major purpose of this Plan of Study is to describe what is to be accomplished and how the study is to be organized. As such, the Plan of Study is a management plan which specifies and describes the time, cost, and performance requirements for formulation and selection of optimum economic and environmentally emphasized plans, and a recommended plan for the area. Thus, the Plan of Study serves as the major integration system for the various activities as well as a coordinative device for the tasks assigned to governmental and private sector entities that are involved and will participate in the planning process and plan formulation program. Even so, the Plan of Study is a flexible document which may be changed through time as conditions warrant. Any major change, however, will require consensus of the Management Group and the Missouri River Basin Commission prior to implmentation.

Multiple Objective Planning

The Water Resource Council's P&S provides the basis for federal participation with river basin commissions, states, and others in the preparation, formulation, evaluation, review, revision, and transmittal to the Congress of plans for states, regions, and river basins; and for the planning of federal and federally assisted water and land resources programs and projects.

Plans for the use of the Nation's water and land resources will be directed to improvement in the quality of life through contributions to the objectives of national economic development and environmental quality. The beneficial and adverse effects on each of these objectives will be displayed in separate accounts of these two designations and with other accounts for the beneficial and adverse effects on regional development and social well-being. Planning for the use of water and land resources in terms of these objectives will aid in identifying alternative courses of action and will provide the type of information needed to improve the decision-making process.

Existing or expected future problems in the Study Area expressed by the people through their local, state, regional, or national institutions have created a need for added or modified patterns of water and land resources management and use. These needs and problems are of such nature that their resolution requires cooperation and coordination by many levels of government and private interests.

Nationally, the overall purpose of water and land resource planning is to promote the quality of life by reflecting society's preferences for attainment of objectives defined to:

A. Enhance national economic development by increasing the value of the Nation's output of goods and services and improving national economic efficiency.

B. Enhance the quality of the environment by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems.

This Plan of Study will also recognize a state-regional preference objective as discussed in more detail under Item 6, Page 22.

For each plan there will be a complete display or accounting of relevant beneficial and adverse effects. The extent to which plans contribute either in a beneficial or adverse way in serving the objectives, as well as the impacts on social well-being, must be evaluated to provide the means for appraisal of individual projects and programs and for comparing tradeoffs.

and related land resources. National forecasts will be used to estimate regional and local development effects on the economy and environment. Alternatives for solving or dealing with problems and meeting planning objectives will be evaluated.

The study is of a reconnaissance level and will deal with a broad array of water and land uses. The study report will identify appropriate agencies to complete feasibility studies (i.e. Level C activities) and implementation action. Scheduling of the various elements of the recommended plan will be presented to indicate how each element relates to projected needs and the urgency and priority associated with meeting the needs. An identification of the elements requiring early action will guide subsequent implementation studies to be initiated by the responsible agencies as a followup to the Level B study.

The time frame proposed for analysis is the base year of 1975, with near-term needs evaluated through 1985 and mid-term needs through 2000.

ORGANIZATION OF STUDY

The Missouri River Basin Commission has responsibility for the conduct, supervision, and management of the study. Funding of the study is through the Water Resources Council directly to the Missouri River Basin Commission. The Commission has central funding responsibility which, due to the short time frame for the study effort, will facilitate a more balanced study effort and effectiveness of management. The proposed organization for the study is shown on the following page.

Study Direction

A Study Manager has been given full authority and responsibility by MRBC to conduct the study, serving under the general supervision and direction of the MRBC Director of Planning and Technical Services. The Study Manager develops work plans, budgets, and schedules for completion of task activities; reviews and evaluates completed work assignments, reports, and studies for quality control, technical adequacy, integration into overall study efforts, compliance with work plan objectives and compliance with WRC Principles and Standards; and prepares recommendations and reports on results of the study efforts.

The Study Manager also serves as Chairman of the Management Group, which advises him on overall management guidance, direction, and control for the study effort.

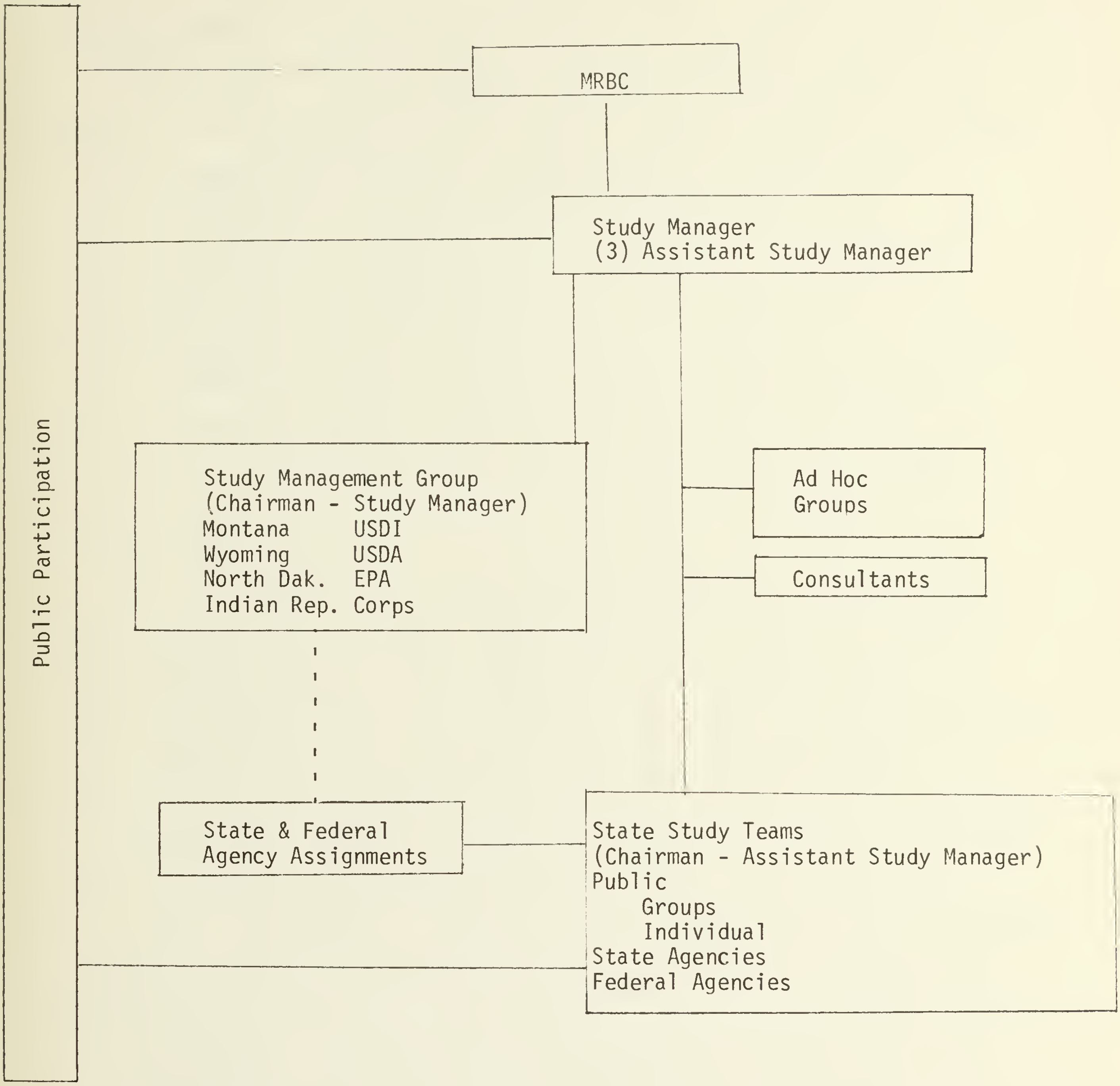
The Study Manager is assisted directly by three Assistant Study Managers. Each Assistant Manager serves as a coordinator of planning and work activities of the study participants in the respective State of assignment. They also maintain continuing liaison with designated representatives of governmental and nongovernmental entities in their respective states for the purpose of delineating and expediting study inputs and outputs.

Figure 2

YELLOWSTONE BASIN AND ADJACENT COAL AREA

LEVEL B STUDY

ORGANIZATION



The Manager and Study Office are located in Billings, Montana with the Assistant Managers' offices located in Helena, Montana; Cody, Wyoming; and Bismarck, North Dakota.

Management Group

A Management Group established for the study is composed of the Study Manager and one representative each from the Corps of Engineers, Environmental Protection Agency, U.S. Department of Agriculture, and Indian tribes, and two representatives of each state and the Department of the Interior. The primary function of the Management Group will be to provide guidance on management and direction for the study effort. In addition, it will provide study performance evaluation, critique, and monitoring and control from a resource allocation context. The Group will thus provide assistance to the Study Manager in policy formulation, direction, and study problem resolutions.

Ad Hoc Groups

During the early phases of the study, it is proposed to assign certain specific tasks to ad hoc groups. These groups will be composed of agency representatives (federal, state, local, etc.) with a given expertise and capability to effectively perform the task assignments. The assigned functional areas will be: specification of basin demands and needs including agriculture in its broad sense; economic development projections of needs; instream flow needs; and others as specified under the work items beginning on Page 30. of this POS. Each group will prepare a technical paper defining base conditions (1975), projected future requirements, the portion of those requirements that will be satisfied through private initiative under the "without plan", and the remaining needs to be met by time frame 1975-1985 and 1985-2000. Upon completion of its assignment, the group will be disbanded and cease to exist as an organizational entity. Each group will have a leader for management purposes and each will report to the Management Group through the Study Manager.

State Study Teams

Plan development, analysis, and associated public participation will be handled through a State Study Team under the direction of the Assistant Study Manager in each state. State Study Teams will be composed of members assigned by federal and state agencies, interested groups, and individual and industry representatives, many serving on more than one team.

The State Study Teams are the most important facet of the study in that they will formulate NED and EQ Plans, perform State/Regional element analysis, and formulate recommended plans for each planning area. A typical sequence of events for the State Study Team in an individual planning area would be:

1. Preparation of a background report.

2. Development of issue papers by individual agency, group, or citizen involved in the study. Issue papers would define the future of the area without additional federal or state involvement, the problems and needs this would leave unfulfilled, necessary programs to meet those needs and reconnaissance benefits and costs of suggested programs. The purpose of the first two sections of the issue paper would be to provide an objective analysis by each agency to compare with projected needs and "future without" plan elements as laid out by the ad hoc groups and the staff. This step somewhat parallels the responsibility of the ad hoc groups in the development of projected needs, and the description of the role of the private sector in meeting those needs. The difference would be in scope and degree of narrative. The ad hoc group presentation will be primarily technical to cover the entire region with a consistent description of needs and a disaggregation of those needs to the specified planning areas. Their technical paper will be primarily descriptive of the analytical methods used and would contain summary tabulations of results.

   In contrast, the data provided by each agency and participant would be primarily descriptive of the opportunities and problems of the specific planning area and with a more elaborate narrative. If properly done, the agency issue papers will provide much of the functional description to be included in the final report. Of equal or greater importance, however, would be the emphasis and thought on the specific goals and objectives for the planning area forced on the writer by the issue paper assignment and a comparison of these objectives with the disaggregated needs provided by the ad hoc groups as summarized by the staff report on remaining needs for the planning area.

3. The formulation of plans emphasizing NED, EQ, and State-RD objectives and the development of a recommended plan, with involvement of the public. Study Team meetings will be held in the planning area under study.

State Involvement

This Level B study effort is heavily oriented to a high degree of State agency participation, both in terms of task performance and policy guidance through service on the Study Management Group. Additionally, each of the respective states will assume a major role through its cost-sharing portion of the total study funding. The degree of state involvement is heightened due to the status of ongoing state programs that are running concurrently with the Level B study effort. As part of its State Water Plan program, the state of Montana is currently working on the Yellowstone Basin. Similarly, the states of Wyoming and North Dakota are moving towards more detailed investigations and evaluations based on their completed Framework Water Plans. Resources expended on these state-oriented efforts will provide substantial input over and above that of the federally funded effort. All work undertaken on the Level B study will provide information for use in the various state plans and programs.

Public Participation

Under the provisions of the Principles and Standards, a continual emphasis on public awareness, involvement, and participation is called for. This is particularly crucial in terms of looking ahead towards effective implementation programs based upon the recommended plans.

Individual citizens and a wide spectrum of interest groups will have unlimited opportunity for direct involvement through all phases of plan formulation.

Individual or group representatives will be invited to participate directly on the State Study Teams or at their option by attending and periodically providing data and comments at the Study Team public meetings.

Public involvement is encouraged at the very beginning of the study planning process with all State Study Team meetings open to the public, announced through the public media and the maintenance of a mailing list of interested citizens and interest groups.

Individual citizens and designated resource spokesmen for interest groups are given equal opportunity on the respective State Study Teams to achieve understanding and make inputs to the planning process on a day-to-day basis.

Interstate and Study Area Planning Coordination

Planning coordination for drainage areas crossing state boundaries will be coordinated in three ways: (1) the Assistant Study Manager for the respective state will maintain constant communication directly and through the Study Manager of the activities in their respective portions of the Study Area; (2) joint planning meetings between the two study teams will be scheduled when conflicts are evident in planning philosophies, and (3) the Assistant Study Managers will be called upon by the Study Manager to report to the Management Group at appropriate times during the plan formulation process.

The Management Group is responsible for developing the Study Area plans based on the planning area and state plans developed by the State Planning Teams. The coordination process listed above for interstate planning should also provide adequate coordination to attain compatability between state plans.

PROCEDURES

General Criteria and Guidelines

To properly coordinate and integrate the diverse aspects of the various tasks and activities required to be performed in the study, it is necessary to establish a set of general criteria and guidelines that can be used on a consistent and uniform basis by all study participants. In addition to these general criteria, it will be necessary during the study to establish specific guidelines for certain functional or geographic areas of analyses. These will be prepared at the outset of work activities to serve as parameters and constraints in the performance of task activities.

General Criteria

1. This study will be of reconnaissance level. For projects, programs, or other elements to be included in the Level B planning analysis they must contain, as a minimum, reconnaissance level cost and benefit information. All plans, programs, or elements contain non-monetary, as well as monetary, costs and benefits. Programs, projects, or elements will be considered for inclusion in the EQ plan primarily as a result of their inherent non-monetary benefits. The sponsor or planning team, however, must also make a satisfactory analysis of monetary benefits and costs of any proposed project, program, or element to reconnaissance standards, for incorporation in the EQ Plan.
2. The base year of 1975 will be used to represent existing conditions and the baseline case from which study projections will be developed.
3. Near-term planning will use a target year of 1985 over the range of 1975-1985 and mid-term planning will cover the period 1985-2000, with a horizon year of 2000. This study will be oriented to result in recommendations for implementation programs in the near-term (1975-1985) but also for

the mid-term (1985-2000) period.

4. The report will recommend continuation of on-going programs or the funding of implementation or feasibility studies (Level C) which are needed.
5. The Water Resources Council's Principles and Standards, as interpreted through approved agency guidelines or the Yellowstone Level B procedures, will be used in this study.
6. The Level B study effort will include an analysis of projects, plans, or elements to test their acceptability for meeting State-Regional goals. To be evaluated for SR acceptability, the project, program, or element must be ineligible for inclusion in either the optimized NED or emphasized EQ plan, it must be funded 100% non-federally, and its total benefits (including induced by and stemming from, external economies, user benefits, unemployed and underemployed resource benefits and construction benefits), must be in excess of total economic costs.
7. The Study Area will include the Yellowstone Basin and Adjacent Coal Area encompassing all or portions of the 51-county area (previously described under Study Area) in the states of Montana, Wyoming, and North Dakota. Some modifications in these specific boundaries will be made to attain consistencies in hydrological, statistical, or disaggregation boundaries or parameters. The state of South Dakota will monitor aspects of the study which will, through planned water use or depletion, have an impact on South Dakota water supplies.
8. Background data to be used in the Level B study will be taken or updated from available sources, such as the reports on studies listed in the Introduction of this POS, to the extent practicable. Major baseline studies will not be undertaken. Recommendations will be made for future

programs to fill serious data gaps. Modifications of existing data may be made, as appropriate, to reflect recent events.

9. Projects and programs constructed, operational, or currently under construction as of January 1976 will be considered as existing. Projects authorized and funded for pre-construction activity will be considered part of the near-term plan. For authorized but unfunded projects, the principles and standards will be applied on a selective basis to be determined by the head of the responsible agency, with opportunity for suggestions from the Water Resources Council and other governmental entities.
10. Existing federal, state, and local laws, regulations, court decrees, interstate compacts, and other forms of institutional constraints will be considered during the study as requirements to be met by the plan. However, where appropriate and to increase the effectiveness of the plan, recommendations for changes or modifications in such institutional constraints will be made. Effects on the plan from potential federal, state, or local laws and regulations will also be discussed and recommendations made as appropriate.
11. The Level B study will be developed on a planning area basis, with appropriate delineations or divisions made on a state basis to maintain state boundary identification, and with aggregations and perhaps some adjustments to attain the recommended plan for the Study Area.
12. During plan formulation, an Environmental Assessment will be prepared which will document the environmental considerations of the study and plans.
13. Scheduling of future planning area studies will be based on the extent of water, land, and related resource conflicts or problems, degree of

controversy over multipurpose objectives and extent of data-information base.

14. Projections, including population, employment, and income, will utilize an alternative futures approach rather than a single or point-in-time forecast. The alternatives will include, as a minimum, three levels: a base case, a most probable case, and an extensive development case. Each case will be documented and qualified as to criteria, assumptions, guidelines, and constraints.
15. Projected needs and demands will be based on the OBERS Series "E" or "E'" projections with appropriate modifications made where applicable to reflect regional variations based on expanded energy, water, and related land development situations. Disaggregations on a planning area basis will also be made. Where OBERS does not provide applicable projections, other bases will be developed and used consistently over the Study Area.
16. While guided by the water sensitivity results of 14 and 15 above, with the exception of the coal producing portion of the Study Area, plans will be formulated to meet only one projected level within the range by time frame. In the Tongue-Powder, North Dakota, and other coal areas, alternative plans will be formulated to each of the three energy scenarios with recognition of appropriate population related requirements and needs.
17. Discount Rate. The interest rate to be used in discounting future costs and benefits in this study, or otherwise converting benefits and costs for common time base, is 6 1/8 percent, the rate presently fixed nationally.
18. Prices and Costs. Indexed current normalized prices for 1970-1974 have been prepared for the Yellowstone Level B and will be used for

agricultural products -- both crop and livestock. For all other products values, or items 1975 prices will be used throughout the study. Also, all cost estimates will be based on January 1975 levels.

19. Cost Allocation and Cost Sharing. Cost allocation is a two-stage process involving the initial allocation of costs among the major objectives and then the further allocation of costs among the components. Only the costs included in the NED account will be allocated between objectives and among their components. Costs will first be allocated to the NED and EQ objectives, and then among their components. Plans emphasizing the EQ objective will be allocated in two stages. Stage 1 will be allocation of total costs between the NED and EQ objectives of the EQ plan; and Stage 2 is the application of the Separable Cost/Remaining Benefits (SC/RB) method to suballocate among the NED components the total costs allocated to the NED objective.

20. Costs for economic and financial analysis include installation, interest during construction, management, operation, maintenance, and replacement.

21. Current reimbursement and cost-sharing policies are being reviewed by WRC in their entirety. Until this review is completed and any changes approved, all current reimbursement and cost-sharing policies in effect at the time of plan selection will be followed.

DEVELOPMENT OF THE PLAN

Plan Formulation

The plans to be developed for the Study Area involve a series of steps starting with the identification of total requirements, needs, and problems, the definition of available resources, formulation of plans, and selection or formulation of a recommended plan. It is an orderly and systematic process which permits the public and decision-makers to be cognizant of the assumptions and guidelines employed, the data and information analyzed, the criteria and methodologies used, and the implications, effects, and impacts of NED, EQ, SR, and recommended plans for the respective planning areas, states, and Study Area as a whole.

Based on the Principles and Standards for planning, the plan formulation process to be followed in the study is illustrated on the following Process Flow Diagram, Figure 3. This process comprises the following major steps:

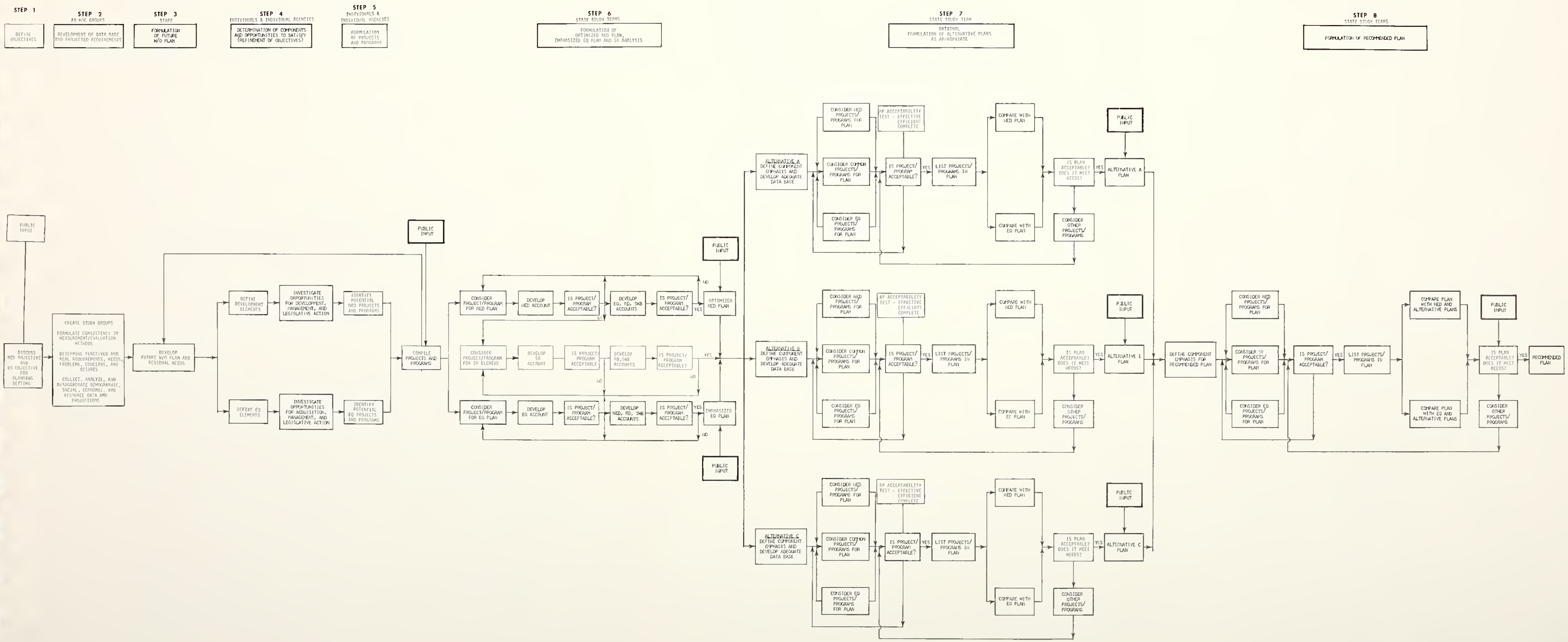
Step 1 - This step is the definition of planning objectives and procedures, and the education of planning participants in the goals, objectives, and requirements of multiple objective planning under the Water Resources Council's Principles and Standards. P&S Guidelines have been developed for this Level B study and training sessions will be conducted in each state and at the State Study Team meetings, as required.

Step 2 - Consultants will be retained, ad hoc groups will be formed, and in some cases individual agencies will be given special assignments to:

(1) Evaluate current conditions within the planning settings--including development of a data base.

YELLOWSTONE BASIN & ADJACENT COAL AREA

PROCESS FLOW DIAGRAM


STEP 1
DEFINE OBJECTIVES
STEP 2
AD HOC GROUPS
DEVELOPMENT OF DATA BASE AND PROJECTED REQUIREMENTS
STEP 3
STAFF
FORMULATION OF FUTURE W/O PLAN
STEP 4
INDIVIDUALS & INDIVIDUAL AGENCIES
DETERMINATION OF COMPONENTS AND OPPORTUNITIES TO SATISFY (REFINEMENT OF OBJECTIVES)
STEP 5
INDIVIDUALS & INDIVIDUAL AGENCIES
FORMULATION OF PROJECTS AND PROGRAMS
STEP 6
STATE STUDY TEAMS
FORMULATION OF OPTIMIZED NED PLAN, EMPHASIZED EQ PLAN AND SR ANALYSIS
STEP 7
STATE STUDY TEAM
OPTIONAL FORMULATION OF ALTERNATIVE PLANS AS APPROPRIATE
STEP 8
STATE STUDY TEAMS
FORMULATION OF RECOMMENDED PLAN
PUBLIC INPUT
DISCUSS NED OBJECTIVE AND EQ OBJECTIVE FOR PLANNING SETTING
CREATE STUDY GROUPS
FORMULATE CONSISTENCY IN MEASUREMENT/EVALUATION METHODS
DETERMINE PERCEIVED AND REAL REQUIREMENTS, NEEDS, PROBLEMS, CONCERNS, AND DESIRES
COLLECT, ANALYZE, AND DISAGGREGATE DEMOGRAPHIC, SOCIAL, ECONOMIC, AND RESOURCE DATA AND PROJECTIONS
DEVELOP FUTURE W/O PLAN AND RESIDUAL NEEDS
DEFINE DEVELOPMENT ELEMENTS
INVESTIGATE OPPORTUNITIES FOR DEVELOPMENT, MANAGEMENT, AND LEGISLATIVE ACTION
IDENTIFY POTENTIAL NED PROJECTS AND PROGRAMS
DEFINE EQ ELEMENTS
INVESTIGATE OPPORTUNITIES FOR ACQUISITION, MANAGEMENT, AND LEGISLATIVE ACTION
IDENTIFY POTENTIAL EQ PROJECTS AND PROGRAMS
PUBLIC INPUT
COMPILE PROJECTS AND PROGRAMS
CONSIDER PROJECT/PROGRAM FOR NED PLAN
DEVELOP NED ACCOUNT
IS PROJECT/ PROGRAM ACCEPTABLE?
NO
DEVELOP EQ, RD, SWB ACCOUNTS
IS PROJECT/ PROGRAM ACCEPTABLE?
YES
NO
PUBLIC INPUT
OPTIMIZED NED PLAN
CONSIDER PROJECT/PROGRAM FOR SR ELEMENT
DEVELOP SR ACCOUNT
IS PROJECT/ PROGRAM ACCEPTABLE
NO
DEVELOP RD, SWB ACCOUNTS
IS PROJECT/ PROGRAM ACCEPTABLE?
YES
NO
CONSIDER PROJECT/PROGRAM FOR EQ PLAN
DEVELOP EQ ACCOUNT
IS PROJECT/ PROGRAM ACCEPTABLE?
DEVELOP NED, RD, SWB ACCOUNTS
IS PROJECT/ PROGRAM ACCEPTABLE?
YES
NO
EMPHASIZED EQ PLAN
PUBLIC INPUT
ALTERNATIVE A
DEFINE COMPONENT EMPHASIS AND DEVELOP ADEQUATE DATA BASE
CONSIDER NED PROJECTS/ PROGRAMS FOR PLAN
CONSIDER COMMON PROJECTS/ PROGRAMS FOR PLAN
CONSIDER EQ PROJECTS/ PROGRAMS FOR PLAN
RP ACCEPTABILITY TEST - EFFECTIVE EFFICIENT COMPLETE
IS PROJECT/ PROGRAM ACCEPTABLE?
YES
LIST PROJECTS/ PROGRAMS IN PLAN
COMPARE WITH NED PLAN
COMPARE WITH EQ PLAN
IS PLAN ACCEPTABLE? DOES IT MEET NEEDS?
YES
CONSIDER OTHER PROJECTS/ PROGRAMS
PUBLIC INPUT
ALTERNATIVE A PLAN
ALTERNATIVE B
DEFINE COMPONENT EMPHASIS AND DEVELOP ADEQUATE DATA BASE
CONSIDER NED PROJECTS/ PROGRAMS FOR PLAN
CONSIDER COMMON PROJECTS/ PROGRAMS FOR PLAN
CONSIDER EQ PROJECTS/ PROGRAMS FOR PLAN
RP ACCEPTABILITY TEST - EFFECTIVE EFFICIENT COMPLETE
IS PROJECT/ PROGRAM ACCEPTABLE?
YES
LIST PROJECTS/ PROGRAMS IN PLAN
COMPARE WITH NED PLAN
COMPARE WITH EQ PLAN
IS PLAN ACCEPTABLE? DOES IT MEET NEEDS?
YES
CONSIDER OTHER PROJECTS/ PROGRAMS
PUBLIC INPUT
ALTERNATIVE B PLAN
ALTERNATIVE C
DEFINE COMPONENT EMPHASIS AND DEVELOP ADEQUATE DATA BASE
CONSIDER NED PROJECTS/ PROGRAMS FOR PLAN
CONSIDER COMMON PROJECTS/ PROGRAMS FOR PLAN
CONSIDER EQ PROJECTS/ PROGRAMS FOR PLAN
RP ACCEPTABILITY TEST - EFFECTIVE EFFICIENT COMPLETE
IS PROJECT/ PROGRAM ACCEPTABLE?
YES
LIST PROJECTS/ PROGRAMS IN PLAN
COMPARE WITH NED PLAN
COMPARE WITH EQ PLAN
IS PLAN ACCEPTABLE? DOES IT MEET NEEDS?
YES
CONSIDER OTHER PROJECTS/ PROGRAMS
PUBLIC INPUT
ALTERNATIVE C PLAN
DEFINE COMPONENT EMPHASIS FOR RECOMMENDED PLAN
CONSIDER NED PROJECTS/ PROGRAMS FOR PLAN
CONSIDER SR PROJECTS/ PROGRAMS FOR PLAN
CONSIDER EQ PROJECTS/ PROGRAMS FOR PLAN
IS PROJECT/ PROGRAM ACCEPTABLE?
YES
LIST PROJECTS/ PROGRAMS IN PLAN
COMPARE PLAN WITH NED AND ALTERNATIVE PLANS
COMPARE PLAN WITH EQ AND ALTERNATIVE PLANS
PUBLIC INPUT
IS PLAN ACCEPTABLE? DOES IT MEET NEEDS?
YES
RECOMMENDED PLAN
CONSIDER OTHER PROJECTS/ PROGRAMS

(2) Project future requirements for water and related lands.

(3) Project future conditions and the capability of resources and facilities without additional or new governmental actions.

(4) Determine the remaining resource needs and problems as the basis for plan formulation.

Step 3 - The staff will take the material provided by the agencies, consultants, and ad hoc groups in Step 2 and prepare a "future-without" plan.

Step 4 - Individual agencies, interested groups, or individuals will evaluate the projected future requirements of the planning setting and define the future conditions and remaining needs and problems of the respective planning areas without additional governmental actions. They should also evaluate existing institutional restraints where they have a negative or restrictive influence on area objectives. The results of Step 4 will be set forth as part of an issue paper.

Step 5 - From the perspective developed in Step 4 and set down in the first part of the planning area issue paper, participants should update, formulate, or reformulate projects, programs, or elements for consideration by the State Study Team for inclusion in NED or EQ plans, and where applicable to test acceptability as an S-R element. The results of Step 5 should be reported as the second half of the agency, group, or individual issue paper.

Step 6 - The State Study Teams as a group, and under the direction of the Assistant Study Manager will formulate an optimized NED Plan and an emphasized EQ Plan, and finally test unacceptable NED or EQ elements for S-R acceptability.

Step 7 - In planning areas where the NED, EQ, or a recommended plan (Step 8) would significantly alter the social structure, environment, or economy of an area, several alternative plans may be required to demonstrate the range of impacts resulting from alternative mixes of NED, EQ, and S-R programs, projects, or elements;-- for these, Step 7 demonstrates the formulation of three alternative plans. In areas where plan impacts are much less significant, Teams can bypass Step 7 entirely or substitute the formulation of two or more NED or EQ plans in Step 6.

Step 8 - Select a recommended plan from among the NED and EQ plans, S-R elements, and alternative plans based upon an evaluation of their beneficial and adverse effects and their tradeoffs.

Schedule and Funds

The proposed schedule for the study contemplates initiation of the study (with full agency participation) in April 1976 with completion of a field draft report and review thereof by August 1, 1977. This draft will be submitted to the Missouri River Basin Commission in its August meeting. Public comment will be sought through public meetings conducted by the states. Formal review of the draft report will proceed August-September 1977. Revisions from all sources will be incorporated,in the final draft to be acted upon by the MRBC in November 1977.

The general schedule of activities is shown in Table 1.

This study utilizing centralized funding will allocate funds through the Missouri River Basin Commission in accordance with work assignments developed in this POS through Agreements for services with each federal department or its designated agency.

Table 2 is a funding allocation to federal departments and agencies and

Table 1

STUDY SCHEDULE

YELLOWSTONE BASIN AND ADJACENT COAL AREA

Work Item	FY 1976			Transition Quarter			FY 1977									
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J
Energy																
Develop Energy Futures	x	x	x													
Agriculture																
Disaggregate OBERS Demands (Ag)	x	x														
Develop New Projection		x	x	x												
Instream Flow																
Develop Envr. Baseline		x	x	x	x											
Develop Recr. Baseline		x	x	x	x											
Develop Water Quality Baseline		x	x	x	x											
Municipal and Rural Domestic																
Unit Water Requirements	x	x														
Flood Control																
Update Framework Flood Control Needs	x	x														
Update Framework Streambank Erosion Needs	x	x														
Develop Critical Flood Plain Mgmt Areas & Benefits	x	x	x	x												
Land Conservation Measures	x	x	x	x	x	x	x	x	x*							
Fish and Wildlife																
Update Framework Requirements & Needs		x	x	x												
Outdoor Recreation																
Update Framework Requirements & Needs		x	x	x												
Erosion Control																
Update Framework Needs	x	x														

*Partial Month

Table 1 (cont'd)

Work Item	FY 1976			Transition Quarter			FY 1977									
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J
Land Use Update Framework Data	x	x	x													
Develop 1975 Level Streamflow Data	x	x	x													
Develop 1975 Surface Water Quality Data		x	x													
Disaggregate OBERS Projections (Population, Income, Employment)	x	x	x													
Legal and Institutional Restraints	x	x	x													
Update Minerals Data	x	x														
State Study Team Participation																
Upper Yellowstone			x	x	x											
Tongue-Powder (Mont, Wyo)				x	x	x	x	x								
Wind-Bighorn-Clarks Fork (Wyo)									x	x	x	x				
Bighorn-Clarks Fork-Lower Yellowstone (Mont)									x	x	x	x				
Western Tributaries			x	x	x	x	x	x	x							
Develop Study Area Plan													x	x		
Provide Assistance in MOP Analysis	x	x	x	x	x	x	x	x	x	x	x	x	x*			
Strip Mine Reclamation Analysis	x	x	x	x	x	x	x	x	x	x	x					
Ground Water Supply and Impact Analysis		x	x	x	x	x	x	x	x							
River and Reservoir Operation Studies		x*	x	x	x	x	x	x	x	x	x	x	x	x		
Develop and Print Base Maps	x	x	x													
Prepare Reports															x	
Print Draft Report																x

*Partial Month

Table 2
YELLOWSTONE BASIN AND ADJACENT COAL AREA LEVEL B
BUDGET BY WORK ITEM
(1000 Units)

Work Item	Consultant	Mont.	N. Dak.	Wyo.	USDA	ERS	FS	SCS	COE	EPA	USDI	BIA	BLM	BM	BOR	NPS	USBR	FSWLS	USGS
Energy																			
Develop Energy Futures	105.6		6																
Agriculture																			
Disaggregate OBERS Demands		2	.5	(2		5		2									2		
Develop New Projection		2	.5			8		8									8		
Instream Flow																			
Develop Env. Baseline		10	6	(2.5			(2											10	(12
Develop Recr. Baseline		5	5												2				
Develop Water Quality Baseline		10	5																
Indian Water Requirements																			
Municipal and Rural Domestic Unit Water Requirements		1	1	.5															
Flood Control																			
Update Framework Control Needs								2	1										
Update Framework Streambank Erosion Needs								2	1										
Develop Critical Flood Plain Mgmt Areas & Benefits		10	5	—				4											
Land Conservation Measures		4	1	—			2	6					6						
Fish and Wildlife Update		2	2	2									1					4	
Recreation Update		2	2	2			2	2					1		14	8			
Land Use Update		4	4	1			4	4					4						
Develop 1975 Level Streamflow Data		4	—	—													4		
Develop 1975 Surface Water Quality Data		—	10	1													4		
Disaggregate OBERS Projections (Population, Income, Employment)		2	—	.5		5		2									2		
Legal and Institutional Restraints		2	—	.5															
Update Minerals Data													1	8					
State Study Team Participation		125	39	36		14	36	36	7	36		24	33	24	24	1	36	27	12
Provide Assistance in MOP Analysis						14		9									6		
Strip Mine Reclamation Analysis													8	8					
Ground Water Supply and Impact Analysis		—	4	2															8
River & Reservoir Operation Studies				1					4								26		
Develop and Print Base Maps		4	2	2															
Management		20	24	10	12				12	12	24								
Other Related Studies		546	343	12															
TOTAL	105	755	460	75	12	46	46	77	25	48	24	24	54	40	40	9	88	41	32

Table 3

Yellowstone Basin and Adjacent Coal Area
Level B Study

Summary of Projected Federal Costs

	1976	Transition Quarter	1977	Total
USDA (Mgmt)	1.5	2.1	8.4	12.0
ERS	16.6	6.8	26.6	50.0
FS	11.0	9.0	26.0	46.0
SCS	21.7	10.0	40.4	73.0
USDA Total	50.8	28.8	101.4	181.0
COE	8.3	6.1	10.6	25.0
EPA	7.4	10.1	30.5	48.0
USDI (Mgmt)	3.1	4.2	16.7	24.0
BIA	3.9	5.3	14.8	24.0
BLM	12.3	10.6	31.1	54.0
BM	10.3	7.1	22.6	40.0
BOR	12.6	7.5	19.9	40.0
USBR	22.0	14.6	51.4	88.0
F&WLS	10.8	8.4	21.8	41.0
NPS	2.4	1.8	4.8	9.0
USGS	9.0	8.0	15.0	32.0
USDI Total	86.4	67.5	198.1	352.0
TOTAL FEDERAL AGENCIES	152.9	112.5	340.6	606.0
STAFF & ADMINISTRATIVE COSTS	172.5	45.5	163.2	381.2
CONSULTANTS & CONTINGENCIES	105.6	0	22.2	127.8
TOTAL	431.0	158.0	526.0	1115.0

to states corresponding to work items shown on Table 1.

Table 3 is a summary of federal costs by year.

Work Items

The following discussion of work items forms a regional overview of the significant problems and policy issues in the Study Area in that it identifies components of the multiobjectives, establishes procedures for developing future "without plan" conditions, discusses the plan formulation process, and defines report responsibilities.

Project Requirements and Determine Needs (Process Flow Diagram - Step 2)

The development of projected needs and baseline data will be done in one of three ways: (1) through consultants as is the case in the energy futures; (2) through ad hoc groups with expertise in a number of technical areas to disaggregate projected data, develop new projection of needs, and to analyze resource capabilities; and (3) the assignment of tasks to individual agencies.

There are some needs categories that can be better defined on a purely local basis; for example, the preservation of cultural or historic sites, resource habitat, or the definition of local social objectives. These will be developed by members of the State Study Teams on a planning area by planning area basis.

WORK ITEM NO. 1

ENERGY

Develop Energy Futures

Responsible Consultant: Harza Engineering Company
150 South Wacker Drive
Chicago, Illinois 60606

Cooperating Agencies: Study Manager and Yellowstone Basin and Adjacent Coal Area Level B Staff

Time Frame: January 19 to June 9, 1976

Budget/Contract: $105,587.00

Description of Task: Develop Energy Futures -- The strippable coal in the Study Area comprise 27% of the Nation's coal energy reserves. If it were not for these tremendous energy reserves and that the Nation has an energy crisis, there would be considerably less urgency for this study.

Development of the coal reserves has already begun. To some, this development is looked upon as an unmixed blessing giving the economy of the area a much needed shot in the arm. To others, the potential development is an unwanted invasion upon their social well-being and the environment of the area.

Each state in the Study Area must protect the rights of its citizens and maintain a viable economy with as little environmental damage as possible. To accomplish this, they need the best analysis they can get on the energy situation nationwide, how that will affect and alter the present mix of fuels used today, how much of the Nation's demands will have to be provided by the energy resources of the Study Area, in what form, at what probable location and at what cost to the quantity and quality of the water and related land resources. Armed with these facts, the states can better establish their energy and related policies.

A consultant will be retained to develop three alternative energy scenarios comparable to those developed in the Northern Great Plains Resources Program but updated to reflect the competitive conditions established by the pricing policies of the OPEC countries, Canada's energy export policies, and new mineral development legislation. The State Study Teams will take this information, determine alternative water supply sources, and make a full analysis of the impact upon the land and water resources of the planning settings.

Work Outline:

Review Study Objectives

Conduct Problems and Needs Survey

Conduct Literature Review and Assemble Basic Data.

Design Study Model.

Perform Energy Analysis Responding to the Following:

1. For the years 1985 and 2000 and the revised price structure what utilization will be made of energy fuels Nationally, and what demands will develop within the Study Area based on three future conditions?
    (a) A low rate of development including only production to meet local needs and to cover exports that are already guaranteed or highly probable.
    (b) A most probable forecast recognizing the effect of social and institutional restraints that may be imposed within the Study Area to maintain quality of life.
    (c) A high forecast based on the contribution that Study Area energy minerals might reasonable be expected to make in meeting national energy demands.

2. Based on the results of (1) above, review the NGPRP assumptions of mine mouth coal gasification, liquefaction and thermal electric power plant numbers and sitings and prepare new sets of alternative development projections.
3. Determine the magnitude of uses of various energy fuels for those portions of the states of Montana, North Dakota, and Wyoming in the Level B Study Area and estimate the quantities that may be exported from each state area to meet National demands.
4. Determine how the energy may be transported within and outside the Study Area. Predict the new energy transport systems that may be required and their capital and operating costs.
5. Develop the basic assumptions to be utilized in the Level B study for energy production and conversion systems, including such items as quantity and quality of water required, capital cost of facilities required, level of direct and secondary employment per plant, family makeup and income levels of those employed in energy mining or production, land use requirements by type of production facility, and taxes generated under existing state legislation.
6. Analyze air and water pollution aspects of each type of production facility included in the three alternative scenarios.

WORK ITEM NO. 2

AGRICULTURE

Ad Hoc Group

Responsible Member: Richard Clark, ERS

Cooperating Agencies:	Participant	Budget
ERS	Richard Clark	$13,000
SCS	Donald Jones	10,000
USBR	Derwood Mercer	10,000
Montana DNR&C	Elna Tannehill	4,000
North Dakota	Arlene Wilhelm[1]	1,000
Wyoming	John Jackson	2,000

Time Frame: Begin upon Notice to Proceed and complete within 90 days of said Notice to Proceed.

Description of Task: The future of agriculture in the Study Area is dependent upon domestic food and industrial requirements, the Nation's agricultural export policies, and the availability of capital to support new development.

Three agricultural requirements projections will be utilized in these studies. OBERS E will provide an adequate low level projection, and OBERS E' will provide an intermediate range projection. A third projection will be developed in the study recognizing regionally developed yields and feed requirements to satisfy the high agricultural projection.

This ad hoc group will also develop an evaluation of the role played by private individuals and entities in meeting the projected requirements to provide input to the future "without plan."

Work Outline:

A. Develop historical and current agricultural structure of the area by county including the following information:

  1. Dryland and irrigated crop acreages of barley, corn (both grain and ensilage), alfalfa, native hay, fallow, oats, pasture, sugar beets, and wheat.
  2. Dryland and irrigated cropland yields and trends for the above-mentioned crops.
  3. Historical livestock sales and inventories and estimates of current consumption by livestock of roughages and feed grains expressed in AUM's and/or feed units.
  4. Other data, as mutually agreed to by the ad hoc group, that are descriptive of the agricultural structure.

B. Disaggregate OBERS Series E and E' projections to a level as mutually agreed upon by the ad hoc group.

C. Development of regional preference agricultural projections.

  1. Define specific assumptions of regional requirements as they relate to the agricultural economy.
  2. On the basis of these assumptions, project parameters included in OBERS agricultural projections.
  3. Compare regional projections with Series E and E' agricultural projections.
  4. Identify implications of regional projections for agricultural resource management and use.

1/ Other North Dakota Participants:

Bonnie Banks

Oscar Lund

WORK ITEM NO. 3

INSTREAM FLOW NEEDS

Ad Hoc Group

Develop Environmental, Recreation, and Water Quality Baseline

Responsible Member: Fish and Wildlife Service

Cooperating Agencies:	Participant	Budget
F&WLS		$10,000
FS	Fred Martin	2,000
EPA	Patrick Godsil	--
BOR	Emanuel Lauck	2,000
USGS	Jim Wilson	12,000
State of Montana	Liter Spence	25,000
State of North Dakota	Russ Stuart[1/]	16,000
State of Wyoming	Frank Trelease[2/]	2,500

Time Frame: Begin upon notification of funding and complete within 120 days.

Description of Task: Suitable stream flows would be desirable for most, if not all, of the streams and rivers in the Study Area. Optimum stream flows would be desirable to maintain and enhance the integrity of a stream ecosystem, prevent water quality degradation, and provide recreation opportunities.

Monetary benefits generally will not support the maintenance of optimum flows. In many competitive cases, even minimum stream flows to maintain some kind of fishery cannot compete economically. However, most would agree that some minimum level of flow is desirable and should be protected.

Some states are considering legislation to make instream flows a beneficial use and subject to reservation or appropriation. Montana recognized instream flows as a beneficial use under the provisions of the Montana Water Use Act. Although instream flows have been or are now being recognized or considered as beneficial uses, no method, procedure, or decision has been made by any of the states in the Study Area to determine just what quantity of flow is most appropriate.

The study must recognize the value of instream flows and will include them. Under the rigid economic criteria dictated by the Water Resources Council for NED plan formulation, the flow so utilized will have to be something less than optimum, but not so for the EQ plan. For more information concerning definitions of minimum flows for NED and optimum flows for EQ refer to the Instream Flow issue paper prepared by the Yellowstone Level B staff.

An ad hoc group will be formed to:

1. Develop a set of instream flow criteria for each type of stream classification found in the Study Area. Each set will include varying instream flows to meet NED or EQ objectives.
2. Critique the Yellowstone Basin and Adjacent Coal Area plans upon their completion to determine shortcomings of the methodology and recommend additional study and coordination.

The establishment of benefits for instream flow will not be accomplished by the ad hoc group but will be provided by State Study Team members during plan formulation.

Work Outline:

A. Estimate instream flow needs for maintenance and/or enhancement of existing fish and wildlife resources, water quality conditions, and outdoor recreation activities.
    1. Form an ad hoc group responsible for developing instream flow estimates.

2. Select a methodology to be used in arriving at instream flow needs.
3. Develop separate individual estimates of instream flows for NED and EQ objectives to meet fish and wildlife, water quality, and outdoor recreation objectives in each of the planning areas.
4. State water quality criteria and regulatory programs are the means by which water quality may be maintained in the future. This work item calls for a description of existing stream water quality and a comparison with state water quality criteria.
    a. Review water quality criteria and use classifications for locations on selected streams in each planning area.
    b. Obtain 1975 updated water quality and quantity data from the ad hoc group for water supply and water quality (Work Items 12 and 13) and compare with water quality criteria.
    c. Determine maximum depletion (assume salt balance and stabilized 100% salt return flow) that can occur and still meet water quality standards.
    d. Determine minimum stream flow guidelines.
5. Upon completion of the Level B study, review the adequacy of the instream flow studies and develop recommendations for additional coordinated studies deemed necessary.

1/ Other North Dakota Participants:

Anton Whitehead
Ron Kiedrowski
Bonnie Banks

2/ Other Wyoming Participant:

Fred Eiserman

WORK ITEM NO. 4

INDIAN WATER REQUIREMENTS

When Indian Reservations were designated, the United States Government claimed the Indians' rights to use then unappropriated water rising on, flowing through, or flowing past the reservation to fulfill the purpose of the reservations. At that time no quantity or specific use for the water was defined and that continues to be the case today. This is true also for the national park, forest, and other federal lands for which water is claimed but not quantified.

The effect of the federal reservation doctrine is twofold: (1) when the water is eventually put to use the right of The United States will be superior to private rights acquired after the formation of the reservation, and (2) the federal use is not subject to state laws regulating appropriation and use of water.

There are three main philosophies or options being considered concerning the Indian water rights: (1) that the magnitude of the right should be set by the amount of water required to irrigate the practically irrigable lands within the boundaries of the reservation, (2) the right could be set by the total water demands of the reservation be they agricultural, municipal, industrial, instream flow, etc. (as such, the right could never be quantified precisely for any subsequent use would be grounds for re-adjudicating the right), and (3) that the right can be utilized for any purpose both on or off the reservation.

While it is generally recognized that the reservations have the senior water rights to most, if not all, water uses adjudicated under state law, the existing water users generally feel that Option (1) is the measure of the right while many tribal members feel that they are entitled to all of the water under Option (3).

With such a wide disparity of opinion, the only way to solve the problem would be a series of long, drawn out studies and negotiations or to go to the courts for determination.

The solution to quantifying Indian Water Rights is plainly beyond the scope of the Yellowstone Level B Study. Planned development on the reservation will not be neglected, however, for developments on the reservation can and will be handled the same as off-reservation demands. They will be constrained only by the economics of the development as imposed by the principles and standards for water resources planning, or, the total demands for goods and services projected in the various demand categories.

It could be argued that downstream non-Indian development will be jeopardized by the threat of future Indian upstream depletions, but if this condition is eminent, it should be a study conclusion and not a preconception.

WORK ITEM NO. 5

MUNICIPAL & RURAL DOMESTIC WATER REQUIREMENTS

Ad Hoc Group

Unit Water Requirements

Responsible Member: Alf Hulteng, Montana Water Quality Bureau

Cooperating Agencies:	Participant	Budget
State of Montana	Alf Hulteng	$1,000
State of North Dakota	Dale Frink[1/]	1,000
State of Wyoming	Frank Trelease	500

Time Frame: Complete within 60 days from Notice to Proceed.

Description of Task: Population projections from OBERS E, E', and a third projection recognizing higher agricultural needs, each modified by selected energy levels will be developed and coordinated by the states. Evaluations of water consumption and any water quality inadequacies will be accomplished by planning area unless critical problems are apparent in which case water supply and water quality will be analyzed in more detail on a community basis.

Work Outline:

A. Population projections and/or disaggregations will be developed by the Agriculture Ad Hoc Group.

B. Unit Water Requirement

   1. Municipal and Related Industrial Demands

      a. Review present population and population served.

      b. List areas of present water inadequacies for quantity or quality.

      c. Project future per capita requirements.

2. Rural Domestic Water Demands
   1. Review present population and population served.
   2. Evaluate existing per capita use and adequacy of water supply (quantity and quality).
   3. Project future per capita requirements.
3. Non-Energy Related Industrial Water Requirements
   1. Review type and present water use.
   2. Project future non-energy water requirement.

1/ Other North Dakota Participant:

James A. Ketterling

WORK ITEM NO. 6

FLOOD CONTROL

Update Framework Flood Control and Streambank Erosion Needs

Drainage Basins in Excess of 400 Square Miles - Agency Assignment

Responsible Member:	Wayne A. Stufft, COE
Budget:	$2,000
Time Frame:	Complete within 60 days of Notice to Proceed
Description of Task:	Flood control needs and benefits from the Missouri River Basin Framework Study will be reviewed, updated, and disaggregated to the Level B planning areas.

Work Outline:

I. The Corps of Engineers will prepare flood damage and streambank erosion data for the main stem reaches as follows:
    A. Update Framework Flood Control Needs
        1. Review MRB Framework Study to determine adequacy of flood damage data for the main stem reaches (drainage areas greater than 400 square miles) in the following categories:
            a. Area subject to flooding
            b. Current average annual damages
            c. Future average annual damages
        2. Revise current damages by interpolating and factoring to obtain a 1975 base condition.
        3. Project future damages based on each of the following conditions:
            a. With flood plain management
            b. Without flood plain management

B. Update Framework Streambank Erosion Needs

1. Review Framework Study to determine adequacy of streambank erosion data for the main stem reaches (drainage areas greater than 400 square miles) in the following categories:
    - a. Length of streams
    - b. Length of and reaches affected by bank erosion
    - c. Average annual damages
2. Revise erosion damages to reflect a 1975 price level

WORK ITEM NO. 7

UPDATE FRAMEWORK FLOOD CONTROL AND STREAMBANK EROSION NEEDS - AGENCY ASSIGNMENT

Drainage Areas Less Than 400 Square Miles

Responsible Member:	Reuben Kammerer, SCS
Budget:	$8,000
Time Frame:	Complete within 60 days of Notice to Proceed
Description of Task:	Flood control needs and benefits from the Missouri River Basin Framework Study will be reviewed, updated, and disaggregated to the Level B planning areas.

Work Outline:

A. Update Flood Control Needs

1. Review MRB Framework Study to determine adequacy of flood damage data for tributary reaches (drainage areas less than 400 square miles) in the following categories:
    a. Area subject to flooding
    b. Current average annual damages
    c. Future average annual damages
2. Revise current damage by interpolating and factoring to obtain a 1975 base condition.
3. Project future damages based on each of the following conditions:
    a. With flood plain management
    b. Without flood plain management

B. Update MRB Framework Study to determine adequacy of streambank erosion data for the tributary stream reaches (drainage areas less than 400 square miles) in the following categories:

1. Review Framework Study to determine adequacy of streambank erosion data for the tributary stream reaches (drainage areas less than 400 square miles) in the following categories:
    a. Length of streams
    b. Length of and reaches affected by bank erosion
    c. Average annual damages
2. Revise erosion damages to reflect 1975 price level

WORK ITEM NO. 8

LAND CONSERVATION MEASURES

Ad Hoc Group

Responsible Member: Reuben Kammerer, SCS

Cooperating Agencies:	Participant	Budget
SCS	Reuben Kammerer	$6,000
BIA	George Jennings	--
FS	Fred Martin	2,000
BLM	Gene Schmidt	6,000
State of Montana	Glen Smith	4,000
State of North Dakota	Ken Rouse[1/]	1,000
State of Wyoming	John Jackson	--

Time Frame: Complete within 270 days of Notice to Proceed, with schedule for planning areas to be complete within 30 days of initiation of planning area study.

Description of Task: Framework watershed protection needs will be updated by the SCS, FS, and BLM and reviewed by the states. Measures that can be evaluated in terms of their water and related land impacts will enter into the planning process. Those plans or programs which cannot be measured in these terms will be included in the "without project" plan as an ongoing program.

Work Outline:

A. Update Watershed Protection Needs using data from Missouri River Basin Framework Study for federal and private lands.

1. Determine area adequately treated and the area still needing treatment by the following land uses:

a. Irrigated Cropland

   b. Non-irrigated Cropland
   c. Pasture and Range
   d. Forest and Woodland
   e. Other
2. Project area to be treated for the above land uses by ongoing programs for the target years 1985 and 2000. Estimate area needing management practices only and the area needing both management and vegetative and/or mechanical practices.
3. Evaluate effects of ongoing watershed protection program on water quality and quantity.
4. Determine costs for ongoing watershed protection program.

B. Determine additional land conservation needs that cannot be accomplished by ongoing programs.
   1. Locate areas needing treatment.
   2. Estimate effects of treatment on water quality and quantity.
   3. Determine suitability for including in the NED, EQ, and SR Analysis.

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[1] Other North Dakota Participant:

Gary Puppe

WORK ITEM NO. 9

FISH AND WILDLIFE UPDATE

Ad Hoc Group

Responsible Member: Fish and Wildlife Service

Cooperating Agencies:	Participant	Budget
F&WLS	Dave Henry	$4,000
BLM	Gene Schmidt	1,000
State of Montana	Don Brown	2,000
State of North Dakota	Russ Stuart	2,000
State of Wyoming	John Boughman	2,000

Time Frame: Complete within 90 days of Notice to Proceed

Description of Task: Overall hunting and fishing opportunities are adequate in the Study Area taken as a whole although many of the opportunities exist at some distance from the population centers which leads to under utilization.

With the potentially large influx of people due to coal and related development, portions of the Area may go from conditions of adequate fish and wildlife resources to one of shortage.

The State Fish and Game agencies and the U.S. Fish and Wildlife Service will update their needs and forecasts to define areas of shortage, conflict, or adequacy. These include: access, hatcheries, wetlands, and other programs as well as instream flow needs discussed earlier.

Only those programs or projects which significantly affect water quality or quantity will be included in the plan formulation process. All other projects or programs deemed necessary by the ad hoc group will be included as an ongoing program in the "future without" project plan.

Work Outline:

A. Enumerate the current needs in each planning area for the conservation, preservation, and restoration of fish and wildlife resources.

   1. Review earlier planning efforts, including reports of the Missouri River Basin Framework Study, Northern Great Plains Resource Program, and other published and documented materials relevant to the subject needs.
   2. Contact appropriate state fish and wildlife agencies and other federal and state agencies as necessary to obtain their analyses of needs.
   3. Define the need to restore any species of fauna or flora, in the planning areas threatened with extinction, to a non-threatened status.
   4. Identify the adequacy of stream access sites and other water-related fish and wildlife facilities in the planning areas and determine the general need for access and such additional facilities to allow public utilization of existing fish and wildlife resources.
   5. Define insofar as possible specific water and related land resource problems that presently act as limiting factors for fish and wildlife populations in the Study Areas.
   6. Determine requirements to protect and preserve existing fish and wildlife resources of the Study Area and to meet projected needs.
   7. Prepare a technical paper outlining all of the expressed needs. The paper will address both general needs of the Study Area and needs more specific to individual planning areas.

WORK ITEM NO. 10

OUTDOOR RECREATION UPDATE

Ad Hoc Group

Responsible Member:

Cooperating Agencies:	Participant	Budget
BOR	Emanuel Lauck	$14,000
FS	Fred Martin	2,000
SCS	Reuben Kammerer	2,000
BLM	Gene Schmidt	1,000
NPS	Richard Strait	8,000
State of Montana	Wesley Burnett	2,000
State of North Dakota	Anton Whitehead	2,000
State of Wyoming	Pete McNiff	2,000

Time Frame: Complete within 90 days of Notice to Proceed.

Description of Task: The Yellowstone Level B Study Area has been blessed with numerous natural recreation areas including Yellowstone National Park, seven national forests, two national grassland areas, and numerous state parks. Local water oriented parks and facilities, however, were found to be in short supply in the Framework Study.

The Framework Recreational demands, capabilities, and needs should be updated by the BOR, State Recreation Agencies, FS, and BLM, in recognition of increased demands brought about by normal population growth and by more intensive coal development and resulting population impacts.

Only those outdoor programs or projects which significantly affect water quality or quantity will be included in the plan formulation process. All other projects or programs deemed necessary by the State Study Team will be included in the "future without" project plan.

Work Outline:

A. Identify recent changes in recreation use patterns and needs caused by limited availability of energy, environmental considerations, etc.

B. Re-evaluate recreation requirements, capabilities, and needs as shown in the Type I Framework Study and update to accommodate new population projections and trends being considered for the Yellowstone Level B Study.

C. Analyze and revise recreation needs to reflect current State Comprehensive Outdoor Recreation Plans and 2nd National Assessment projections.

WORK ITEM NO. 11

LAND USE UPDATE

Ad Hoc Group

Responsible Member: Reuben Kammerer, SCS

Cooperating Agencies:	Participant	Budget
SCS	Reuben Kammerer	$4,000
BLM	Gene Schmidt	4,000
FS	Fred Martin	4,000
BIA	George Jennings	--
State of Montana	Glen Smith	4,000
State of North Dakota	Leroy Klapprodt[1]	4,000
State of Wyoming	John Jackson	1,000

Time Frame: Complete within 90 days of Notice to Proceed.

Description of Task: The purpose of this work item is to provide the planning teams with a tabulation of current land use for description and evaluation. The FS, BIA, BLM, and SCS will participate with state representatives to develop these data.

Work Outline:

A. For each planning area, state areas within the Study Area and the entire Study Area provide tabulations of existing:
    1. Land Use (irrigated and non-irrigated cropland, forest and woodland, pasture and range, other agriculture, recreation, fish and wildlife, urban and transportation, water, mineral industry, and military).
    2. Significant characteristics of land resource areas precipitation, elevation, land use, native vegetation, and soil.
    3. Land and water areas by county.

4. Federal, Indian, state, and private surface and subsurface ownership by administering agency.

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[1] Other North Dakota Participant:

Oscar Lund

WORK ITEM NO. 12

DEVELOP 1975 LEVEL STREAMFLOW DATA

Ad Hoc Group

Responsible Member: Derwood Mercer, USBR

Cooperating Agencies:	Participant	Budget
USBR	Derwood Mercer	$4,000
State of Montana	Rick Bondy	4,000
State of North Dakota	Dave Sprynczynatyk	--
State of Wyoming	Frank Trelease	--

Time Frame: Complete within 90 days of Notice to Proceed.

Description of Task: The Missouri River Basin Framework Study included tabulations of historic flows through 1963 adjusted to a projected 1970 depletion level. Actual streamflow data is now available through water year 1974 (October 1974). Historic records should be adjusted for estimated depletions occurring between 1963-1974 which are not reflected in the historic records. The planning teams can then utilize these adjusted flows to determine the available water resources and impacts of NED, EQ, Alternative or Recommended Plans.

Work Outline:

A. From framework update, national assessment and contact with state and federal agencies:
    1. Establish 1963-1975 depletions by source and location.
    2. Revise long-term records at designated stations to reflect 1975 conditions on a monthly basis in 1000 AF Units.

WORK ITEM NO. 13

DEVELOP 1975 SURFACE WATER QUALITY DATA

Ad Hoc Group

Responsible Member: Derwood Mercer, USBR

Cooperating Agencies:	Participant	Budget
USBR	Derwood Mercer	$4,000
State of Montana	Rick Bondy	--
State of North Dakota	Jeff Hauge	10,000
State of Wyoming	Frank Trelease	1,000

Time Frame: Complete within 90 days of Notice to Proceed.

Description of Task: Historic and projected water quality baseline data developed for the MRB Framework also needs to be adjusted to reflect the water quality impact of later depletions.

Work Outline:

A. From depletion studies accomplished from framework update national assessment and contact with federal and state agencies:

  1. Develop historic water quality data at stations with five years or more of record for TDS, Ca, Mg, SO_4, Na, NO_3, PO_4.
  2. Assuming salt balance and fully developed return flow, adjust water quality records to reflect 1975 flow conditions.

WORK ITEM NO. 14

DISAGGREGATE OBERS PROJECTIONS FOR POPULATION, INCOME, AND EMPLOYMENT

Ad Hoc Group

Responsible Member: Richard Clark, ERS

Cooperating Agencies:	Participant	Budget
ERS	Richard Clark	$5,000
SCS	Donald Jones	2,000
USBR	Derwood Mercer	2,000
State of Montana	Elna Tannehill	2,000
State of North Dakota	Bonnie Banks[1/]	--
State of Wyoming	John Jackson	500

Time Frame: Complete within 90 days of Notice to Proceed.

Description of Task: An ad hoc group for development and disaggregation of economic projections will be formed of representatives of each state, the ERS, SCS, and USBR. The purpose of this group will be to provide historic and projected economic data by county, planning area, and state with which the State Planning Teams can evaluate economic impacts or formulate plans.

Work Outline:

A. Develop the historical and current economic structure of the study area.
  1. Population
    a. Cities of 5,000+
    b. Other urban area populations
    c. Rural non-farm populations
    d. Rural farm populations
  2. Tabulate components of total income of the area from BEA and State data represented by:

    a. Per capita income
    b. Total Income
    c. Distribution of income by counties
3. Tabulate employment data by industry for each county from BEA, ERS, and state sources.
4. Tabulate per capita and total earnings from each sector by counties.
5. From the 1970 census of population, tabulate age group, sex, education, and income levels by county.

B. Disaggregate Series E demographic and economic projections to a level as mutually agreed upon by the ad hoc group.

1. Disaggregate population projections and estimate distribution among:
    a. Urban
    b. Rural non-farm
    c. Rural farm
2. Disaggregate income.
3. Disaggregate employment by industrial sector.
4. Disaggregate earnings by industrial sector.

C. Estimate for Series E' demographic and economic projections to a level as mutually agreed upon by the ad hoc group.

1. Project population and estimate distribution among:
    a. Urban
    b. Rural non-farm
    c. Rural farm
2. Estimate income
3. Estimate employment by industrial sector.
4. Estimate earnings by industrial sector.

1/ Other North Dakota Participants: Arlene Wilhelm and Oscar Lund

WORK ITEM NO. 15

LEGAL AND INSTITUTIONAL RESTRAINTS

Responsible Member: N/A

Cooperating Agencies:	Participant	Budget
State of Montana	Ted Doney	$2,000
State of North Dakota	Murray Sagsveen	--
State of Wyoming	Jack Palma	500

Time Frame: Complete within 90 days of Notice to Proceed.

Description of Task: There are many legal and institutional factors that must be recognized and evaluated in the Level B study. A joint federal-state analysis of the legal and institutional framework is being prepared for the MRB Framework Update. Each of the states will be asked to review the updated chapter on legal and institutional restraints to determine the adequacy of their contents for our use. If adequate, no further work will be required. However, to the extent that the chapters are inadequate for our purpose, the available data will be completed to fulfill the following outline:

Work Outline:

A. Inventory Existing Constraints
    1. Interstate compacts
    2. Water quality standards
    3. National pollution discharge elimination system
    4. Water rights
    5. Other, including active litigation

B. Evaluate Existing Statutes of Operating Agencies
    1. Federal statutes and policies
        a. Criteria and regulations

- 2. State statutes and policies
  - a. Criteria and regulations

C. Define Problems of Operation and Administration within Existing Institutional Constraints

D. Recommendations

- 1. Modifications of existing statutes
  - a. Operating and implementation
  - b. Compacts, etc.
- 2. Requirements for enforcement
  - a. Flood plain regulations
  - b. Water quality standards
  - c. Water rights
  - d. NPDES
- 3. Modification of existing institutional structure

WORK ITEM NO. 16

UPDATE MINERALS DATA

Ad Hoc Group

Responsible Member: Ronald Pense, BM

Cooperating Agencies:	Participant	Budget
BM	Ronald Pense	$8,000
BLM	Gene Schmidt	1,000
State of North Dakota	Wes Norton	--

Time Frame: Complete within 60 days of Notice to Proceed.

Description of Task: The purpose of the minerals update is to determine if water or water quality impacts of potential developments (exclusive of newly planned energy minerals developments) are of significant scope to be included in the plan formulation process.

Work Outline:

A. Identify mineral resource base for each planning area.

B. Project future mineral activity demands exclusive of energy mineral resources for each planning area.

C. Develop unit and total water requirements for the mineral industry for each planning area.

WORK ITEM NO. 17

FUTURE WITHOUT PROJECT ANALYSIS - STAFF ASSIGNMENT[1/]

Responsible Member:	MRBC Staff
Cooperating Agencies:	Review by All Federal and State Agencies
Time Frame:	July 1, 1976 - July 15, 1976

Description of Task: The social, environmental, and economic impact of an alternative plan must be measured as the difference between "with plan" conditions and the conditions that would have existed at the represented time level (1985-2000) in the absence of a plan. It is, therefore, imperative to develop a future "without plan" recognizing those changes that would occur (1975-1985 and 1985-2000) in the absence of a plan.

Each ad hoc group will provide a "future without" plan analysis for its respective functional responsibility. This information will be used to develop a "future without" project plan by the Yellowstone Basin and Adjacent Coal Area Level B Staff.

Work Outline:

A. Define 1975-1985 and 1985-2000 changes w/o plan. See ad hoc group assignments for agency responsibility of following items:
    1. Land Utilization
        a. Agricultural land
        b. Non-agricultural land
    2. Flood Damages - Streambank Erosion
    3. Agricultural Water
        a. Irrigation
        b. Livestock
    4. Municipal, Rural Domestic, and Industrial Water Supplies

5. Soil Loss Problems
    a. Sheet
    b. Gully
6. Drainage
7. Electric Power
8. Water Quality Control
9. Outdoor Recreation
10. Fish and Wildlife
11. Environmental Conditions
12. Social Conditions
13. Other

[1] Future W/O Project

Step 3 of the Process Flow Diagram - Figure 3

WORK ITEM NO. 18

PLAN FORMULATION BY PLANNING AREA[1/]

STATE STUDY TEAM PARTICIPATION

Responsible Member: Assistant Study Managers

Cooperating Agencies:	Participant	Budget
ERS	Richard Clark	$14,000
FS	Fred Martin	36,000
SCS	Donald Jones[1/]	36,000
COE	Wayne Stufft	7,000
EPA	Patrick Godsil	36,000
BIA	George Jennings	24,000
BLM	Gene Schmidt	33,000
BM	Ronald Pense	24,000
BOR	Emanuel Lauck	24,000
NPS	Richard Strait	1,000
USBR	Jerald Farringer[2/]	36,000
F&WLS	Dave Henry	36,000
USGS	Rick Hutchinson[3/]	12,000
State of Montana	Randy Biehl[4/]	125,000
State of North Dakota	Bonnie Banks[5/]	39,000
State of Wyoming	Daniel M. Badura[6/]	36,000

Time Frame: Complete plan formulation within 300 days of Notice to Proceed.

Description of Task: The ad hoc groups will develop the projected needs in the Study Area. To meet the remaining needs as determined in the "future without" plan, the state and federal agencies, as well as interest groups or individuals, will provide information on programs or projects to meet these remaining needs. This information will be submitted via an issue paper to the State Study Team through the Assistant Study Managers.

The State Study Teams will formulate an optimized NED plan, an emphasized EQ plan, and test rejected elements for SR acceptability. In planning areas where the NED or EQ plan would significantly alter the social structure, environment, or economy of an area, the Teams may formulate additional NED or EQ plans or formulate alternative plans as required utilizing a mix of NED, EQ, and SR elements. After completing these formulations, a recommended plan would be developed from the NED and EQ plans, SR elements, and alternative plans.

Work Outline:

A. Participate in plan formulation
    1. Review and revise background paper provided by Assistant Study Manager.
    2. Prepare planning area issue paper defining .....
        a. agency, group, or individual objectives and responsibilities in the planning area (this will help clarify the agencies' role).
        b. existing conditions in the planning area.
        c. estimated future water and land resource conditions without additional government involvement. (This information provided by agencies and individuals will be used to compare with ad hoc committee projections for identification or major differences in projections).
        d. suggested programs and projects to meet the residual needs.
        e. four-account information to show beneficial and adverse

effects of suggested programs, projects, and elements to meet needs.

3. Attend 1 to 4 State Study Team meetings per planning area, including public meetings.
4. Assist in the following State Study Team activities for each planning area.
    a. From the array of potential projects or programs test each for acceptability and inclusion in NED or EQ plan, or to rate S-R elements for acceptability and inclusion in an alternative or recommended plan.
    b. Assist in modifying programs or projects to improve acceptability, effectiveness, efficiency, and completeness as modified.
    c. Develop alternative plans, if required.
    d. Formulate a recommended plan.

1/ Other SCS Participants:

Reuben Kammerer
Neal McClure

2/ Other USBR Participants:

Jerald Farringer
Derwood Mercer
John W. Sutphin

3/ Other USGS Participants:

J. L. Poole
Walter R. Scott
Sam W. West

4/ Other State of Montana Participants:

Max Botz
Don Brown
Eldon Fastrup
Gary Fritz
Barbara Garrett
Sharon Solomon
Wayne VanVoast

5/ Other North Dakota Participants:

Ike Ellison
Dale Frink
Jeffrey Hauge
A. William Johnson
Dr. Charles Metzger
Bruce Renhowe
Anton Whitehead

6/ Other Wyoming Participants:

Margaret Bovee
Joe Cyphers
Carl Fifield
Don Fraker
Robert Harris
Arnold Headley
Frances Hoadley
Don Livingston
W. B. Oliver
Bob Ostlund
Joe Racine
Allie Ritterbrown
Newell Sorenson

6/ Other Wyoming Participants (continued)

Miki Straughan
Elizabeth Thomas
Frank Trelease
Art Williamson
James Whaley
Bruce Yates

1/ Work Item No. 18

Steps 6, 7 and 8 of the Process Flow Diagram, Figure 3.

Other Activities

Work Items 19-23 provide assistance or special analyses to the State Study Teams in the formulation of plans and the development of planning area, state and Study Area reports (Work Item No. 24).

WORK ITEM NO. 19

PROVIDE ASSISTANCE IN MOP ANALYSIS

Responsible Member: Assistant Study Managers

Cooperating Agencies:	Participant	Budget
ERS	Richard Clark	$14,000
SCS	Donald Jones	9,000
USBR	Derwood Mercer	6,000

Time Frame: Complete all analyses within 360 days of Notice to Proceed. Schedule as necessary.

Work Outline:

A. Provide Assistance in MOP Analysis

  1. Develop benefit and cost data for selected programs and projects requested by State Study Teams to augment information supplied by sponsoring agency, group, or individual.

    a. Beneficial and Adverse Effects

      (1) National Economic Development

        (a) User benefits

      (2) State-Regional Development

        (a) Induced by and stemming from

        (b) Unemployed and underemployed

        (c) Construction expenditures

      (3) Environmental Quality

      (4) Social Well Being

    b. Costs

      (1) Construction

      (2) OM&R

      (3) Taxes

      (4) External Diseconomies

WORK ITEM NO. 20

STRIP MINE RECLAMATION ANALYSIS

Ad Hoc Group

Responsible Member: Ronald Pense, BM

Cooperating Agencies:	Participant	Budget
BM	Ronald Pense	$8,000
USGS[1/]		--
BLM	Gene Schmidt	8,000
State of North Dakota	Ed Englerth	--

Time Frame: Complete within 330 days of Notice to Proceed with area analysis to coincide with State Study Team schedule for each planning area.

Work Outline:

A. Strip Mine Reclamation Analysis

1. Assemble available reclamation analyses and data within planning areas.

]. Determine typical costs and feasibility of land reclamation.

3. Provide land use impact analysis report for specific coal development alternative areas defining:

   a. Capabilities of reclaimed land for:

      (1) Livestock grazing

      (2) Crop agriculture

      (3) Fish and wildlife habitat or other recreational use

      (4) Other

4. Define water quality impacts at specific coal development alternative areas.

[1/] USGS to participate through provisions of Work Item No. 21.

WORK ITEM NO. 21

GROUND WATER SUPPLY AND IMPACT ANALYSIS

Ad Hoc Group

Responsible Member: USGS - Pike, Scott, West

Cooperating Agencies:	Participant	Budget
USGS	Pike, Scott, West	$8,000
State of Montana		--
State of North Dakota	Milton Lindvig	4,000
State of Wyoming		--

Time Frame: Complete within 240 days of Notice to Proceed, with area analysis to coincide with State Study Team schedule for each planning area.

Work Outline:

A. Ground Water Supply and Impact Analysis

1. Assemble available ground-water information at specific locations that will be affected by proposed withdrawals.
2. Predict magnitude and timing of ground-water withdrawal effects on surface flow and ground water reservoirs.

WORK ITEM NO. 22

RIVER AND RESERVOIR OPERATION STUDIES

Ad Hoc Group

Responsible Member: Derwood Mercer, USBR

Cooperating Agencies:	Participant	Budget
USBR	Derwood Mercer	$26,000
COE	Wayne Stufft	4,000
EPA		--
State of Wyoming	Frank Trelease	1,000

Time Frame: Complete within 390 days of Notice to Proceed with planning area analyses to coincide with State Study Team schedule.

Work Outline:

A. Perform River and Reservoir Operation Studies for State Study Teams

  1. In participation and cooperation with State Study, Teams provide river and reservoir operation studies to evaluate water impacts (quantity and quality) of recommended plan.

    a. Develop existing river and reservoir operating criteria.

    b. Develop a future w/o added projects river and reservoir operation criteria.

    c. Provide plan-in-progress assessments of water supply impacts of competing uses.

    d. Prepare a planning area monthly operation study for the recommended plan.

    e. Prepare a planning area water budget.

    f. Prepare state and study area assessments of cumulative effects of recommended plans on Bighorn, Yellowstone, and Missouri Rivers.

WORK ITEM NO. 23

DEVELOP AND PRINT BASE MAPS

Ad Hoc Group

Responsible Member: Keith Corrigall, MRBC Staff

Cooperating Agencies:	Participant	Budget
State of Montana	Don Breiby	$4,000
State of North Dakota	Dale Frink	2,000
State of Wyoming	Dave Woodhams	2,000

Time Frame: Complete within 90 days of Notice to Proceed.

Description of Task: Develop and print base maps. An ad hoc group composed of one member from each state will develop a uniform set of planning area, state, and study area base maps for use by State Study Teams.

Work Outline:

- A. Inventory Available Maps
  - 1. Determine what maps (federal, state, and local) have been published.
  - 2. Make list of available maps and information described
- B. Prepare base maps for planning area, by state, within the Study Area and total Study Area:
  - 1. Suggested scales
    - a. Study Area Map 1:1000,000
    - b. Planning Area and State Maps 1:500,000
- C. Print 100 copies each of State and Study Area map, and 250 copies each of Planning Area map.

WORK ITEM NO. 24

PREPARE REPORTS

Responsible Member: Assistant Study Managers

Cooperating Agencies: Participant Budget

All agencies will participate as part of their participation on State Study Teams.

Time Frame: Complete report by August 1, 1977.

Work Outline:

1. State Study Teams will prepare reports for planning area and state plans.
2. Management Group, with assistance of Assistant Study Managers, will prepare Yellowstone Basin and Adjacent Coal Area Level B Report, obtain informal review comments, and revise.

APPENDIX A.

COMMUNICATIONS LIST

YELLOWSTONE LEVEL B STAFF

Study Manager
Robert H. Madsen
Transwestern Life Building
Room 332, 404 North 31st
Billings, Montana 59101

Assistant Study Manager
Keith Corrigall
c/o DNR&C, Water Resources Div.
Room 217, 32 South Ewing
Helena, Montana 59601

Assistant Study Manager
Donald Ohnstad
601 East Bismarck Avenue, Room 16
Bismarck, North Dakota 58501

Assistant Study Manager
Paul Shore
Northfork Star Route
Cody, Wyoming 82414

MANAGEMENT GROUP

Don Dexter
Chief of Fisheries
Wyoming Game & Fish Department
Cheyenne, Wyoming 82002

Orrin A. Ferris
Dept. of Natural Resources & Conservation
32 South Ewing
Helena, Montana 59601

Patrick Godsil
Environmental Protection Agency
Water Planning Branch
Suite 900, 1860 Lincoln Street
Denver, Colorado 80203

Blaine Halliday[1]
State Conservationist for Wyoming
Federal Office Building
P.O. Box 2440
Casper, Wyoming 82601

(Management Group Cont'd)

Paul Harley
Missouri Basin Planning Officer
Department of the Interior
P. O. Box 428
Downtown Postal Station
Omaha, Nebraska 68101

Gene Krenz
North Dakota State Water Commission
900 East Boulevard
Bismarck, North Dakota 58501

Mr. Oscar Lund
State Planning Office
4th Floor - Capitol Building
Bismarck, North Dakota 58501

Fletcher Newby
Director and Deputy Director
Fish & Game Department
Mitchell Building
Helena, Montana 59601

Wayne A. Stufft
Division Office
U.S. Army Engineers Division
Corps of Engineers
P.O. Box 103
Omaha, Nebraska 68101

Frank Trelease
Director, Wyoming Water
Planning Program
2001 Central Avenue
Cheyenne, Wyoming 82002

John VanDerwalker
U.S. Department of the Interior
Fish and Wildlife Service
P.O. Box 25486
Denver Federal Center
Denver, Colorado 80225

[1] Dennie G. Burns (Alternate)
Assistant State Conservationist
Soil Conservation Service
Federal Office Bldg. - Box 2440
Casper, Wyoming

FEDERAL

Richard Clark
Economic Research Service
100 Centennial Mall N., Rm. 435
Lincoln, Nebraska 68508

Jerald Farringer
U.S. Bureau of Reclamation
Box 2553
Billings, Montana 59103

Patrick Godsil
Environmental Protection Agency
Water Planning Branch
Suite 900, 1860 Lincoln Street
Denver, Colorado 80203

Dave Henry
U.S. Fish & Wildlife Service
711 Central Avenue
Billings, Montana 59102

Rick Hutchinson
Resources Division, USGS
3 North 7th Street West
Billings, Montana 59101

George Jennings
Agency Coordinator
Bureau of Indian Affairs
P.O. Box 2553
Billings, Montana 59103

Donald Jones
Soil Conservation Service
U.S. Department of Agriculture
P.O. Box 970
Bozeman, Montana 59715

Reuben Kammerer
Soil Conservation Service
Box 2440
Casper, Wyoming 82601

Emanuel Lauck
Agency Coordinator
Denver Federal Center, Box 25387
Denver, Colorado 80225

Fred Martin
Agency Coordinator
Forest Service
Room 3001, Federal Building
Missoula, Montana 59801

Neal McClure
Soil Conservation Service
Room 270, Federal Building
Bismarck, North Dakota 58501

Derwood Mercer
Field Planning Branch (Code 740)
U.S. Bureau of Reclamation
P.O. Box 2553
Billings, Montana 59103

Ronald Pense
Bureau of Mines
Building 20, Denver Federal Center
Denver, Colorado 80225

J. L. Poole
Water Resources Division, USGS
P. O. Box 25046 - Stop 406
Denver Federal Center
Denver, Colorado 80225

Gene Schmidt
Bureau of Land Management
District Office
Worland, Wyoming 82401

Walter R. Scott
U.S. Geological Survey
P.O. Box 778
Bismarck, North Dakota 58501

Richard A. Strait
National Park Service
655 Parfet Street
P.O. Box 25287
Denver, Colorado 80225

John W. Sutphin
Field Planning Branch
U.S. Bureau of Reclamation
P.O. Box 2553
Billings, Montana 59103

Sam West
U.S. Geological Survey
Box 2087
Cheyenne, Wyoming 82001

TRIBAL

Robert Harris, Sr.
Chairman
Shoshone Business Council
Kinnear, Wyoming 82514

Arnold Headley, Chairman
Arapahoe Business Council
Ethete, Wyoming 82514

Rose Crow Flies High, Chairwoman
Fort Berthold Tribal Council
New Town, North Dakota 58753

Patrick McLaughlin, Chairman
Standing Rock Sioux Tribal Council
Fort Yates, North Dakota 58538

Daniel Old Elk, Chairman
Crow Tribal Water Resources Commission
P.O. Box 1094
Crow Agency, Montana 59022

Allen Rowland
President
Northern Cheyenne Tribal Council
Lame Deer, Montana 58763

Patrick Standsoverbull, Chairman
Crow Tribal Council
Crow Agency, Montana 59022

MONTANA

Randy Biehl
Department of State Lands
State Capitol
Helena, Montana 59601

Rick Bondy
Chief, Engineering Bureau
Water Resources Division
Dept. of Natural Resources & Cons.
32 South Ewing
Helena, Montana 59601

Max Botz
Water Quality Bureau
Department of Health and
Environmental Sciences
Capitol Complex
Helena, Montana 59601

(Montana - cont'd)

Don Breiby
Chief, Cartography Section
Department of Natural Resources &
Conservation
32 South Ewing
Helena, Montana 59601

Don Brown
Administrator, Planning Division
Research Park Building, Box 5
Montana State University
Bozeman, Montana 59715

Wesley Burnett
Montana Fish and Game Department
Mitchell Building
Helena, Montana 59601

Eldon Fastrup
Department of Agriculture
State Capitol
Helena, Montana 59601

Gary Fritz
Water Resources Division
Dept. of Natural Resources & Cons.
32 South Ewing
Helena, Montana 59601

Barbara Garrett
Planning Division
Department of Community Affairs
Capitol Complex
Helena, Montana 59601

Thomas Komberec
Montana Fish and Game Department
Mitchell Building
Helena, Montana 59601

Chuck Parrott
Dept. of Natural Resources & Cons.
32 South Ewing
Helena, Montana 59601

Glen Smith
Dept. of Natural Resources & Cons.
32 South Ewing
Helena, Montana 59601

(Montana - Cont'd)

Sharon Solomon
Montana Energy Advisory Council
Lt. Governor's Office
State Capitol
Helena, Montana 59601

Liter Spence
Montana Fish and Game Department
Mitchell Building
Helena, Montana 59601

Elna Tannehill
Department of Natural Resources &
Conservation
32 South Ewing
Helena, Montana 59601

Wayne Van Voast
Bureau of Mines and Geology
Room 111, 3021-6th Avenue North
Billings, Montana 59101

NORTH DAKOTA

Bonnie Banks
State Planning Division
4th Floor - Capitol Building
Bismarck, North Dakota 58501

Ike Ellison
Natural Resources Coordinator
Governor's Office
Capitol Building
Bismarck, North Dakota 58501

Ed Englerth
Public Service Commission
Capitol Building
Bismarck, North Dakota 58501

Dale Frink
State Office Building
900 East Boulevard
Bismarck, North Dakota 58501

Jeff Hauge
State Health Department
Capitol Building
Bismarck, North Dakota 58501

(North Dakota - Cont'd)

Ruben Hummel
c/o General Delivery
Mott, North Dakota 58646

A. William Johnson
North Dakota REAP
Capitol Building
Bismarck, North Dakota 58501

James Ketterling
Box 727
Mandan, North Dakota 58554

Ron Kiedrowski
Williston Basin Regional Council
for Development
Law Enforcement Center
512-4th Avenue, NE
Williston, North Dakota 58801

Leroy Klapprodt
State Water Commission
900 East Boulevard
Bismarck, North Dakota 58501

Tom Kuntz
Lewis & Clark 1805
RC&D
P.O. Box 236
Mandan, North Dakota 58554

Richard Lefor
North Star Route, Box 51
Gladstone, North Dakota 58630

Milton Lindvig
State Water Commission
State Office Building
900 East Boulevard
Bismarck, North Dakota 58501

Charles Metzger
Energy Coordinator
Governor's Office
State Capitol Building
Bismarck, North Dakota 58501

Evelyn Newton
Box 58N
Gladstone, North Dakota 58630

(North Dakota - Cont'd)

Wes Norton
North Dakota Geological Survey
900 East Boulevard
Bismarck, North Dakota 58501

Bea Peterson
Flagstaff Farm
New England, North Dakota 58647

Gary Puppe
Soil Conservation Committee
2nd Floor - Capitol Building
Bismarck, North Dakota 58501

Ken Royse
State Water Commission
State Office Building
900 East Boulevard
Bismarck, North Dakota 58501

Murray Sagsveen
State Water Commission
900 East Boulevard
Bismarck, North Dakota 58501

Dave Sprynzcynatyk
State Water Commission
State Office Building
900 East Boulevard
Bismarck, North Dakota 58501

Russ Stuart
Commissioner
Game & Fish Department
2121 Lovett Avenue
Bismarck, North Dakota 58501

Anton Whitehead
State Outdoor Recreation Agency
Route 2, Box 139
Mandan, North Dakota 58554

Arlene Wilhelm
104-3rd Avenue East
Dickinson, North Dakota 58601

Delores Zieman
951 West 6th Street
Dickinson, North Dakota 58601

WYOMING

Daniel M. Badura
Agricultural Interests
Belfry, Montana 59009

John Boughman
Wyoming Game and Fish Department
Cheyenne, Wyoming 82002

Margaret Bovee
League of Women Voters
218 North Douglas
Powell, Wyoming 82435

Joe Cyphers
Wyoming Outdoor Council
Route 1, Box 242, 749 Rd. 10
Powell, Wyoming 82435

Fred Eiserman
Wyoming Game and Fish Department
3535 CY Avenue
Casper, Wyoming 82601

Carl Fifield
Park County Planning Office
Box 110, Courthouse
Cody, Wyoming 82414

Don Fraker
County Commissioner
Star Route
Belfry, Montana 59009

Frances Hoadley
Powder River Basin Resource Council
Box 150
Gillette, Wyoming 82716

John Jackson
State Water Planning Office
2001 Central Avenue
Cheyenne, Wyoming 82002

Don Livingston
Chamber of Commerce
902-11th St. West
Box 1569
Cody, Wyoming 82414

Tony Mancini
State Water Planning Office
2001 Central Avenue
Cheyenne, Wyoming 82002

(Wyoming - Cont'd)

Pete McNiff
Recreation Committee
604 East 25th Street
Cheyenne, Wyoming 82002

W. B. Oliver
Nat. Coal Assoc.
P.O. Box 2180
Carter Oil Company
Houston, Texas 77001

Bob Ostlund
Agricultural Interests
Box 989 - 304 Douglas Hwy.
Gillette, Wyoming 82716

Jack Palma
Attorney General's Office
Capitol Building
Cheyenne, Wyoming 82002

Joe Racine, Director
Gillette-Campbell Co. Plan. Off.
City Hall
Gillette, Wyoming 82716

Allie Ritterbrown
Environmental Organizations
920 Park Avenue
Cody, Wyoming 82414

Newell Sorenson
Tri.-Co. Land-Use Planning Office
Box 228
Basin, Wyoming 82410

Miki Straughan
League of Women Voters
555 Marion
Sheridan, Wyoming 82801

Elizabeth Thomas
Meeteetse Preservation Organization
Box 37
Meeteetse, Wyoming 82433

James Whaley
Bighorn RC&D Project
Shell Rte.
Greybull, Wyoming 82420

Art Williamson
Wyoming Department of
Environmental Quality
Hathaway Building
Cheyenne, Wyoming 82002

Dave Woodhams
State Water Planning Office
2001 Central Avenue
Cheyenne, Wyoming 82002

Bruce Yates
Chamber of Commerce
330 North Main
Sheridan, Wyoming 82801

APPENDIX B.

STATE STUDY TEAM

PLANNING AREA REPORT OUTLINE

SUMMARY

Chapter 1 - Introduction

1. Purpose of report
2. Discuss the study organization
3. Define the area and describe it as part of the Yellowstone Basin and Adjacent Coal Area Level B Study
4. Study Area objectives

Chapter 2 - Natural Resource Baseline

1. Physiography and geology
2. Climate
3. Soils and vegetation
4. Mineral resources
5. Land use
    a. Agricultural
    b. Non-agricultural
6. Land ownership and administration
    a. Surface
    b. Subsurface
7. Fish and Wildlife
8. Outdoor recreation resources
9. Water resource
    a. Water Supply
        1. Surface
           Drainage network
           Present uses
        2. Ground water
           Present uses
    b. Water Quality
        1. Surface
        2. Ground

Chapter 3 - Socio-Economic Characteristics

1. Population
2. Income
3. Employment
4. Etc.

Chapter 4 - Water and Related Land Resource

Problems/Opportunities

1. Future w/o project analysis -
    a. The role of private enterprises
    b. Remaining needs
        1. Irrigation
        2. Saline seeps
        3. Municipal water supply and waste treatment
        4. Flood control
        5. Indian water requirements
        6. Instream flows
        7. Energy development
        8. Livestock water
        9. Recreation
        10. Land conservation
        11. Fish and wildlife
        12. Erosion

Chapter 5 - Projected Requirements - 1985 - 2000

1. Irrigation
2. Saline seeps
3. Municipal water supply and waste treatment
4. Flood control
5. Indian water requirements
6. Instream flows
7. Energy development
8. Livestock water
9. Recreation
10. Land conservation
11. Fish and wildlife
12. Erosion

Chapter 6 - Plan Formulation

1. Planning Elements
2. The NED Plan
3. The EQ Plan
4. State-Regional Element Analysis
5. Formulation of Alternative Plans
    a. Water supply
    b. Water quality
    c. Land use changes

Chapter 7 - The Recommended Plan

Chapter 8 - Impact Analysis

1. Water
2. Water Quality
3. Other

Chapter 9 - Recommended Plan Evaluation

1. Cost Allocation
2. Display of Plan Accounts Showing Effects and Impact
3. Financial Analysis

Chapter 10 - Recommendations and Conclusions